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The distribution and category status of adjectives and adverbs

John Payne, Rodney Huddleston and Geoffrey K. Pullum

Abstract

It has long been argued that the environments in which adjectives and adverbs occur are mutually exclusive. This claim is based on a superficial observation that adjectives modify nouns, while adverbs modify other categories. In this paper, we argue that there are a substantial number of environments in English where complementarity, thus defined, does not hold. One interesting such environment is the function of modifier of nouns, and in one section of this paper we present a detailed analysis of a rarely observed construction in which adverbs, like adjectives, have this function.

Complementarity between adjectives and adverbs is often used in support of a further claim, periodically espoused by a variety of linguists from Kuryłowicz (1936) to Baker (2003), that adjectives and adverbs are effectively inflectional variants of a single major category. In the final sections of this paper, we argue not only that complementarity as defined does not hold, but that distribution *per se* is irrelevant to the issue of whether adverbs are inflectionally or derivationally related to adjectives. A review of the arguments points towards adverbs in English in fact standing on the derivational side of the boundary, and forming a distinct (though in some respects atypical) major category.

1 Introduction

The notion that adjectives and adverbs occur in mutually exclusive environments has a long ancestry. It originates in the definitions of traditional grammars and dictionaries which represent adjectives and adverbs as complementary types of modifier: the way it is usually put, an adjective modifies a noun, and an adverb modifies a verb, an adjective, or another adverb. The traditional view is perpetuated, either tacitly or overtly, in some modern accounts of English grammar. It is typically expanded by the addition of further categories, notably higher-level projections including clauses,

to those which can be modified only by adverbs. And the (frequently tacit) assumption is made that complementarity also holds of environments in which adjectives function as complements rather than modifiers; in particular, it is often assumed that in the complement position of verbs, for example *be* or *seem*, the choice of adjective rather than adverb is forced. At the very least, complementarity is assumed to apply to adjectives and adverbs formed from them in *-ly*, even if not to words such as *here* (many take expressions of time and place like this to be adverbs, on which see section 4).

What grammarians seem to have in mind, then, is a formulation of the complementarity claim that could be stated as in (1) – where we follow traditional grammar in saying ‘adjective’ and ‘adverb’, though in modern terms it would be phrasal categories AdjP and AdvP:

(1) COMPLEMENTARITY CLAIM

- (i) In modifier function, the choice between adjective and adverb is fully predictable from the category that is modified: adjectives modify nouns, and adverbs modify all other categories.
- (ii) In complement function, only adjectives are permitted.

The complementarity claim thus makes the standard assumption that adjectives and not adverbs function as verbal complements. Then, with complement function removed from the equation, it postulates that knowing whether an item was a modifier of a particular category would be sufficient to enable the choice between adjective and adverb to be made. It is understood in the complementarity claim that a top-level set of category distinctions are to be invoked (at least the major categories of noun, verb, adjective and preposition), together with their higher or extended projections, in which we include the category of clause.

It would be possible to accept the complementarity claim while maintaining that adjectives and adverbs are distinct categories. In this case, the relationship between morphologically-related adjectives and adverbs such as *angry* and *angrily* would be category-changing and therefore a derivational one. This is essentially the traditional view, and it has been explicitly defended in depth by Zwicky (1995).

However, some work in linguistics has used the complementarity claim as the foundation for a further claim, namely that adjectives and adverbs are merely syntactically conditioned contextual variants of a single major category. The relationship between *angry* and *angrily* in this view would then simply be, like the relationship between *write* and *written*, an inflectional one. We will refer to this as the single category claim:

(2) SINGLE CATEGORY CLAIM

Adjectives and adverbs are contextual variants of a single major category.

To the best of our knowledge, the use of complementarity to justify the single category claim, insofar as it relates to English, originates with Lyons (1966), with particular reference just to manner adjectives and their adverb counterparts ending in *-ly*. The idea itself should however probably be attributed to Kuryłowicz (1936: 83), who treats

the comparable suffix *-ment* in French as a ‘morphème syntactique’ that functions not to change the meaning of the adjective to which it is attached, but rather to signal that it modifies a verb rather than a noun. Some French linguists have pursued this idea in greater detail, notably Moignet (1963). Subsequently, the use of complementarity as an argument for the single category claim appeared within generative grammar, initially and apparently independently in Emonds (1976), then in a very influential textbook (Radford 1988). With greater emphasis on the alleged inflectional nature of *-ly*, it can also be found in the morphological literature, for example Sugioka & Lehr (1983:295), Bybee (1985:84ff), and a textbook by Plag (2003). Most recently and comprehensively, it has been espoused by Baker (2003).

The first aim of this paper is to show that the complementarity claim as defined in (1) is, for English at least, simply false. There are a number of environments, including the rarely noticed function of post-head modifier of nouns, where both adjectives and adverbs can occur. For the most part, the choice between adjective and adverb is semantically contrastive in these environments, and not simply a matter of free or register-determined variation. In section 2 we provide a historical outline of the arguments which have been used to justify the complementarity claim. Then in section 3, we lay the groundwork for a detailed evaluation by stating the distributional frames, pre-head modifier of nouns and verbs respectively, which we assume as defining two sets which we will call the adjective distributional core and the adverb distributional core. In section 4, on the basis of the description of English grammar in Huddleston & Pullum *et al.* (2002; henceforth *The Cambridge Grammar*), we further create a ‘best chance’ for complementarity by analysing as prepositions some items which have traditionally been considered as adverbs, and by analysing as determinatives some items traditionally considered as pronouns. The ‘best-chance’ scenario nevertheless fails. In sections 5–9, the heart of the paper, we discuss in turn and in some detail an extended range of potentially contrastive environments in which the adjective and adverb distributional cores can occur. These are: post-head modifier of nouns (section 5), modifier of adjectives (section 6), complement (section 7), external modifier (section 8), and adjunct (section 9).

In the final two sections of the paper, we turn to a discussion of the single category claim. In section 10, we argue first that no case for the single category claim can be based on distribution *per se*, either the presence of complementarity or the absence of it, and secondly that no clear case emerges from any of the other arguments which have been adduced in support of it. Ultimately, a decision has to be based on whether adverbs can be construed as a distinct (and single) major category, and in section 11 we develop the arguments which we believe point towards this conclusion. The paper ends with a brief discussion of what is nevertheless untypical about the adverb category.

2 The complementarity claim

The complementarity claim has its origins in the definitions familiar from traditional grammars and dictionaries. These generally define adjectives and adverbs along the lines

shown in (3), or relatively minor variants thereof:

- (3) (a) ADJECTIVE: a word that modifies a noun
 (b) ADVERB: a word that modifies a verb, an adjective or another adverb

The relatively minor variants are of two kinds. In the first place, some use such expressions as ‘qualify’, ‘describe’ or ‘add to the meaning of’ instead of or in addition to ‘modify’. But more importantly, some works add to the list of categories that an adverb can modify, the most common additions being preposition phrase and clause or sentence. The definitions in (3) present the adjective and adverb as complementary kinds of modifier, and this complementarity is explicitly built into the definition of the adverb given in Nesfield (1898: 9–12):

- (4) (a) An adjective is a word that enlarges the meaning and narrows the application of a noun.
 (b) An adverb is a word that enlarges the meaning and narrows the application of any part of speech except a noun or pronoun.

A modern statement of the same claim viz-a-viz adverbs can be found in Matthews (1997: 10):

- (5) In the grammar of English and many similar languages, an adverb is effectively a word that modifies anything other than a noun.

Despite this, we note that it is in fact rare for traditional grammarians to explicitly exclude nouns in this way from the categories modifiable by adverbs. The possibility in principle that an adverb might modify a noun is recognised by, for example, Sweet (1891:124):

- (6) The grammatical function of independent word-modifying adverbs is to modify adjectives, adverbs, verbs and occasionally nouns.

Sweet’s examples include two distinct types: *He is quite a gentleman* and *the house here*.¹ Modern grammars would of course not treat the first type as an example of an adverb attributively modifying a noun, since the adverb *quite* is modifying not the noun *gentleman* but the NP *a gentleman* (a function we identify in section 8 as ‘external modifier’). Sweet simply drew the distinction in terms of linear position relative to the noun, contrasting the adjective *only* of *an only son* with the adverb *only* of *He is only a child*. Sweet’s second example raises a different issue. Almost without exception, modern grammars and dictionaries do indeed categorise words such as *here* as adverbs, and thus have to claim that the post-head modifier function (see section 5) in *the house here* is one which can in principle have both adverbs and adjectives as exponents. For example, Quirk *et al.* (1985 : 453) list *here* among the adverbs of time and place that can postmodify nouns, and since some of these can also be used attributively (they give as examples *the downstairs hall*, *the backstage noise*, *the above quotation*), they also have to acknowledge that the attributive modifier function is one in which adjectives and adverbs might both occur. In section 4, we will argue that these items are not adverbs. However, the

NP-modifier function and the post-head modifier function are indeed contexts in which we will show that both adjective and adverb can occur.

It is also worth noting that the definitions in (3) concentrate exclusively on the modifier function of adjectives and adverbs. An adjective–adverb pair such as *remarkable* and *remarkably* differ however not just in what categories they can modify, but also in that it is the adjective that is selected in predicative function:

- | | | |
|-----|---------------------------------------|---|
| (7) | MODIFYING FUNCTION | PREDICATIVE FUNCTION |
| (a) | i. <i>definite</i> progress | ii. Their progress was <i>definite</i> |
| (b) | i. They <i>definitely</i> progressed. | ii. *Their progress was <i>definitely</i> . |

Compare also such a pair as:

- (8) (a) *Obviously*, he was only bluffing.
 (b) That he was only bluffing was *obvious*.

In (8a) we have an adverb modifying a clause, whereas in (8b) we have an adjective related as predicative to a clause as subject. The predicative function cannot be subsumed under that of modifier, and is therefore also potentially a function in which the complementarity of adjectives and adverbs needs to be explored. We note that grammars such as Quirk *et al.* (1985: 453,n) explicitly state that ‘adverbs’ such as *backstage* can be used ‘predicatively’ with the verb *be*, e.g. *The noise is backstage*.

The use of complementarity as justification for the single category claim appears to originate for English with Lyons (1966). Considering manner adverbs such as *beautifully* in *Mary dances beautifully*, Lyons notes that they are, in Jespersen’s (1929: 97) terms, ‘tertiary’ in rank: they function as modifiers of predicates. Adjectives by contrast are primarily ‘secondary’: they function as predicates in examples such as *Mary is beautiful*. The attributive modifier function is more complex however: the adjective *beautiful* in *a beautiful dancer* can be, at a deeper level, either secondary or tertiary. This accounts for the ambiguity of this expression, i.e. a ‘beautiful dancer’ is either a dancer who is beautiful or one who dances beautifully. A comparable but sharper example would be *a heavy smoker*, where the ‘tertiary’ interpretation (one who smokes heavily) contrasts markedly with the ‘secondary’ one (a smoker who weighs a lot).² Nevertheless, in both cases, only the adjectival variant can be selected in the noun modifier function, and thus there appears to be no possibility of contrast in English between the ‘adjective’ and the ‘adverb’. Lyons notices superficial minimal pairs such as *She smells nice* and *She smells nicely*, but points out that these are distinct in ‘deep’ structure. *Nice* is obviously predicative, while *nicely* functions as a modifier of the intransitive verb *smell*. Having accepted complementarity, at least for this class of related adjectives and adverbs, Lyons then suggests: ‘The obvious solution is to say that the “adverbs” are positional variants of the corresponding “adjectives” (the allotment of the “derivational” suffix *-ly* being a matter of low-level transformational rules).’

The use of complementarity as justification for the single category claim was not immediately adopted by mainstream linguists in the transformational framework. It surfaces first in the work of Emonds (1976: 12–13), who states that adverbs which are formed from adjectives with *-ly* can be treated ‘simply as adjectives in a

verb-modifying rather than a noun-modifying function'. As an additional distributional argument, Emonds points to the ability of adverbs to occur in exactly the same type of construction as adjectives, e.g. comparatives and superlatives. However, in work done at about the same time, Jackendoff (1977: 252–3) proposes a feature-based analysis of grammatical categories that represents adverbs as a minor category clearly related to the adjective category but distinguished from it by the feature $\pm comp$: adjectives may take a complement, and adverbs nearly always may not. (Ironically, although we will defend the claim that there are two distinct categories here, this will not constitute a defence of the distinction Jackendoff draws, because he underestimated the extent to which adverbs take complements. See *The Cambridge Grammar*, 571–2 for examples of a number of different adverbs taking subcategorised complements of various categories.)

Complementarity as justification for the single category claim then figures prominently a decade later in one of the most influential textbooks of the time (Radford 1988: 137–141). Radford reiterates the idea that adjectives modify nouns while adverbs modify adjectives, verbs, prepositions and adverbs; he then coins the term 'adjective' for the single category. (The reader will perhaps not be too surprised that this term has found no favour with the linguistic community. We have never seen it used by anyone, in fact, except where Radford is being quoted.)

The most comprehensive statement of complementarity as justification for the single category claim is a relatively recent one, Baker (2003: 230–57). For Baker, adjectives are the $[-N, -V]$ category, i.e. not nouns and not verbs. Lacking the referential properties of nouns and theta-marking properties of verbs, they basically occur as the default category in environments where nouns and verbs do not. One such environment is the attributive modifier function: adverbs then simply represent the form of the adjective chosen when the category modified is not NP but VP, AP, PP or TP (clause). Baker maintains that complementarity is a 'robust' generalisation.

Finally, an influential morphology textbook of the same date (Plag 2003: 196) invites students in its exercises to measure $\cdot ly$ against a set of criteria for derivational vs inflectional status. The conclusion, in the key to the exercises, is that $\cdot ly$ is basically inflectional. In particular, the criterion 'Is $\cdot ly$ syntactically relevant?' is satisfied according to Plag by complementarity: if an adjective modifies a noun, it does not take $\cdot ly$. On the other hand, if the 'adjective' modifies a verb or an adjective, then it must take $\cdot ly$.

3 The adjective and adverb distributional cores

In order to evaluate the complementarity claim, it is necessary to make some preliminary assumptions about the items that should be included in the set of adjectives and the set of adverbs respectively. Note that any decisions that are made at this stage do not prejudge the single category claim: we are simply interested in the distribution of two sets, irrespective of whether their members are eventually judged to stand in an inflectional or derivational relationship to each other. Our strategy will essentially be to assume that there are two basic environments in English in which complementarity does indeed hold and to use these environments as distributional test frames for establishing the

membership of two sets, the adjective distributional core and the adverb distributional core. Then, testing the two sets thus obtained in a wider range of environments, we will show that the complementarity claim itself must be false.

The two environments we choose to establish the membership of the adjective distributional core and the adverb distributional core are respectively: (a) pre-head modifier of nouns, and (b) pre-head modifier of verbs:

- (9) a. Det X N (X = ADJECTIVE)
 b. Subj Y V (Y = ADVERB)

Thus, any item X which can appear after a determiner and before a noun (and does not by other distributional criteria belong to another category) will be adjudged to belong to the adjective distributional core.³ And any item which can appear after a subject and before a verb (and does not by other distributional criteria belong to another category) will be adjudged to belong to the adverb distributional core. Thus, quite straightforwardly, all attributive adjectives are included in the distributional core of adjectives, and a vast number of adverbs formed from them with *-ly* are included in the distributional core of adverbs.

Essentially, like all distributional criteria, the two environments are language specific. This is especially true of the restriction to pre-head position (post-head positions are not a good starting point in English because there is, as we will see, no complementarity in these environments). However, the restriction to noun and verb modifiers reflects an intuition that if a language has a differentiated set of adjectives, then these should be able to function as noun modifiers, and if it has a differentiated set of adverbs, then these should be able to function as verb modifiers (for some typological justification of this intuition, see section 11).

The adverbs which are included by the given criterion belong to a wide range of different traditional semantic types, as illustrated (non-exhaustively) in (10).

- (10) a. I easily opened the door (Manner Adverb)
 b. I particularly
 like your new suit (Focussing Adverb)
 c. I fully understand (Degree Adverb)
 your concern
 d. I usually go to the (Frequency Adverb)
 south coast
 e. I immediately stood up (Temporal Location Adverb)
 f. I locally source (Spatial Adverb)
 my produce
 g. I morally reject (Domain Adverb)
 your position
 h. I probably misunderstood you (Modal Adverb)

As far as we can tell, the majority of proponents of the complementarity claim would have no objection to any of the adverbs in (10) being considered as valid exemplars.

A possible exception is Lyons (1966), who explicitly restricts attention solely to manner adverbs. For the purposes of this paper, we will however proceed on the basis that the complementarity claim is not to be restricted in this way. Such a restriction would represent a dramatic narrowing of its scope, both in terms of the number of adverbs covered and correspondingly of the number of adjectives from which they are formed, and thereby effectively concede that complementarity between adjectives and adverbs was not a general phenomenon. What is more, in the end, even though manner adverbs do not so patently counterexemplify the complementarity claim as some of the other types, a few cases are identified in the text where they do so.

A further point that must be made at this stage is that under the criteria in (9) we must also include in the adverb distributional core a number of items which are not formed from adjectives with *-ly*, either because they are morphologically simple, or because they are formed in other ways. Some illustrative examples are: *even, just* (focussing adverbs); *quite, rather, almost* (degree adverbs); *still, already* (aspectual adverbs); *never, often, always* (frequency adverbs); *soon* (temporal location adverb); *perhaps, maybe* (modal adverbs). Although the inclusion of such items is not at all crucial to a test of the complementarity claim (simply looking at adverbs in *-ly* would suffice), they satisfy our criterion, and we can see no valid reason for excluding them from consideration. Their existence, we will argue in section 11, is very relevant (*pace* Emonds 1976: 12) to an evaluation of the single category claim.

Once distributional cores have been established, it is possible to consider expanding the adjective and adverb sets by including other items which do not satisfy the initial criterion, but occur in other environments occupied by items in the distributional cores. In this case, the decision will typically be based on semantic similarity to items already established as belonging to one core or the other. For example, we might extend the adverb set to include the item *very*, which does not modify verbs, but like *exceptionally* functions as a degree modifier of adjectives. As another example, the adjective set can be extended to include never-attributive adjectives such as *amiss* using this procedure. We refer to these items as extended members of the respective sets, and we will occasionally use them in our discussion of environments in which complementarity does not hold. However, non-complementarity in any given environment will first be established using the respective distributional cores.

4 Category revisions in *The Cambridge Grammar*

We now turn our attention to the range of environments in which complementarity can be tested. Our discussion of these environments is based on the description in *The Cambridge Grammar*, and the purpose of this section is to provide a 'best-case' scenario for complementarity by taking into account a number of cases in which traditional categories are subjected to reanalysis in that description.

Consider first the various environments in which an adjective or adverb functions as a non-verbal lexical modifier. In these environments, summarised in Table 1, *The Cambridge Grammar* assumes that complementarity does indeed hold (see Table 1).

Table 1. Non-verbal lexical modifier

		Adj(P)	Adv(P)
MODIFIER OF:	adjective (Adj)	* (but see section 6)	<i>visibly</i> [ADJ dishonest]
	adverb (Adv)	*	<i>visibly</i> [ADV dishonestly]
	preposition (P)	*	<i>visibly</i> [P up]
	determinative (D)	*	<i>visibly</i> [D few]
	noun (N): attributive	the <i>visible</i> [N stars]	*
	noun (N): post-head	the [N stars] <i>visible</i>	* (but see section 5)

In Table 1 we have most of the cases in which an adverb functions as modifier, either of a non-verbal lexical category or a phrase headed by such a category. These include Adj, Adv, P, D (determinative) and N, plus related phrasal categories such as AdjP, AdvP, PP, DP (determinative phrase) and Nom (nominal). (Nom should be thought of as N' by those X-bar theorists who take a phrase like *the dog* to be an N'', or as NP by those who take it to be a DP.) We consider modifiers within the VP (or clause) under the more general heading of 'adjunct': this will then include clausal modifiers as well as related 'supplements' (often known as 'parentheticals') which are not integrated into the syntactic structure. The category Nom excludes the determiner function, and thus does not itself constitute a full NP. We therefore also treat modifiers of NP separately, and call them 'external' as opposed to the 'internal' modifiers within Nom. Order is often not relevant, but it will be important to distinguish the internal modifiers of nouns as attributive (pre-head), or post-head. The attributive position is of course our original distributional test frame for adjectives.

The modifiers in Table 1 clearly illustrate the supposed complementarity of the modifier function: adverb forms are selected for modifiers of all non-verbal lexical categories except N. It must be noted however that two revisions of traditional category boundaries are required for this supposed complementarity to hold. These are the boundaries between (i) adverbs and prepositions, and (ii) pronouns and determinatives.

(i) Adverbs and prepositions

We have noted that words like *here*, *downstairs*, *outside* and *backstage* are traditionally considered as adverbs. The distribution of these words is however quite unlike that of a typical *-ly* adverb such as *visibly* in Table 1, and what is more, they would not satisfy our initial adverb test frame of verbal pre-head modifier. Consider (11), with *outside* and

downstairs as illustrations:

- (11) (a) i. They were sitting ii. She slept *downstairs*.
 outside.
 (b) i. [The chair *outside*] ii. [The bed *downstairs*]
 is broken. is broken.
 (c) i. The chair is *outside*. ii. The bed is *downstairs*.

In (11a) they are post-head modifiers of the verb. In (11b) they are post-head modifiers of the noun, which is where we would expect an adjectival form like *visible*. And in (11c) they are complements of the verb *be*. Again this is a function where we do not generally expect an adverb: they are not modifying the verb *be* any more than the predicative complement *visible* is in *The stars are visible*. The traditional parts-of-speech doctrine is commonly criticised for the heterogeneity of the adverb category, and one significant and well-motivated improvement is to remove from it all of the words like *here*, *outside*, *downstairs*, etc. *Outside* is uncontroversially a preposition in *They were sitting outside the hut* and, as first observed by Jespersen (1924:88–9) and developed by a number of linguists in the generative framework including Emonds (1976), there are no valid reasons for assigning it to different parts of speech according to whether or not it has an NP complement.⁴

In *The Cambridge Grammar*, therefore, the *outside* of (11ai–ci) is analysed as a preposition, not an adverb. And once it is accepted that prepositions (like verbs, nouns and adjectives) may occur without a complement, the way is open to analyse *downstairs* as a preposition too. As prepositions, these words naturally occur as complements of the verb *be*, and contra Quirk *et al.* (1985) their function in this case is locative rather than predicative. *Downstairs* does not, for example, occur as complement of complex-intransitive *seem* and *become* or complex-transitive *render* and *make*. They also function as post-head modifiers: *the chair outside* then has essentially the same analysis as *the chair outside the front door*, where the modifier is a PP. And in examples like *an outside toilet*, we have a limited range of prepositions rather than adverbs occurring as attributive modifiers.

The consequence of this revision is, then, that a significant set of traditional adverbs are removed from environments in which the adjectival form is predicted, namely as attributive and post-head modifiers of nouns.

(ii) Pronouns and determinatives

In traditional grammar pronouns form a separate part of speech: the definitions in (3) thus do not cover the modification of pronouns. *The Cambridge Grammar* follows most work in modern linguistics in taking the pronoun to be a subclass of noun rather than a distinct primary category, but this then predicts (correctly) that any internal modifier of a pronoun will be adjectival. Pronouns generally allow very limited modification, but we have examples like *lucky you*, *poor old me*, etc. (see *The Cambridge Grammar*: 430). It should be noted that analyses which treat personal pronouns as belonging to the category D, as proposed by Abney (1987) and generally accepted by proponents of the

DP hypothesis, make the incorrect prediction that the modifiers of these items will be adverbs.

The traditional class of pronouns includes the so-called indefinite pronouns comprising such words as *any*, *some*, *many*, *few*, etc., when used without a following head in NP structure (as in *There isn't any left*),⁵ together with the compounds *anybody*, *nothing*, *someone*, etc. The characteristic modifier of these words is an adverb:

- (12) (a) There's [*hardly* any] left.
 (b) They found [*precisely* nothing].
 (c) [*Almost* anybody] could do it.

If these words were pronouns, the attributive modifier function would have to admit adverbs as well as adjectives.

There are good reasons, however, for excluding these words from the pronoun category. The non-compound forms *any*, *some*, *many*, *few*, etc. most often occur as determiner to a following head, and it is an unnecessary complication to assign them to different categories according as they are or are not followed by a head. The same structural difference is found with certain kinds of adjectival modifiers, and here no-one suggests that the structural difference is accompanied by a categorial one. Compare:

- (13) (a) i. [*Few* doctors] are here. ii. [The *best* doctors] are here.
 (b) i. [*Few* (of the doctors)] are here. ii. [The *best* (of the doctors)]
 are here.

Just as *best* is an adjective in (13bii) as well as (13aii), so we claim that *few* is a determinative in (13bi) as well as (13ai). As for the structure, we analyse the bracketed NPs in (b) as 'fused-head' constructions: *few* functions as fused determiner-head, *best* as fused modifier-head (cf. *The Cambridge Grammar*: 410–22).

One reason for not making a category distinction between the (a) and (b) examples in (13) is that the items concerned take the same modifiers in the two constructions. Thus *few* can be modified by *very* in (13bi), just as in (13ai), and the same applies to *best* in the (13ii) examples. Similarly for *any* and *no* in (12a–b): compare *There's hardly any money left* and *They found precisely no evidence*. This case is quite different, therefore, from that shown in (14):

- (14) (a) i. It was a *professional* job. ii. It was a genuinely *professional* job.
 (b) i. She's a *professional*. ii. She's a genuine *professional*.

Professional is an adjective in (14a) but a noun in (14b), and this is reflected in the different modifiers it takes, an adverb (*genuinely*) in (14aii) and an adjective (*genuine*) in (14bii). It is of course also reflected in the fact that the noun enters into an inflectional contrast of number: compare *They're professionals*.

The forms *anybody*, *nothing*, *someone*, etc., take the same adverb premodifiers as the first base of the compound, a determinative – compare, for example:

- (15) (a) i. *hardly* any doctors ii. *absolutely* no money
 (b) i. *hardly* anybody ii. *absolutely* nothing

The compounds too are accordingly analyzed as determinatives; they function as fused determiner-heads with the fusion transparently reflected in the morphology (see *The Cambridge Grammar*: 423–4 – and for further argument see Payne, Huddleston & Pullum 2007). This analysis, unlike the pronoun analysis, neatly accounts for the fact that the premodifiers of such forms are adverbs while postmodifiers, as internal modifiers within NP, are adjectival. Compare the adverb in *absolutely nothing* with the adjective in *nothing absolute*.

With the two category reanalyses justified above, *The Cambridge Grammar* came to the conclusion that in the function of non-verbal lexical modifier, complementarity does indeed hold. That this conclusion was incorrect is demonstrated in sections 5 and 6 below.

5 Adverbs as postmodifiers of nouns

We turn now to the first construction not noted in *The Cambridge Grammar* that constitutes a major counterexample to the complementarity claim. The existence of this construction leaves no hope of defending the notion that adverbs do not modify nouns. It is of impeccable grammaticality and has proved to be widely attested; it is noted in, for example, Jespersen (1913: 292; 1940: 82–3, 109), Lee (1998: 139) and Fu *et al.* (2001), but overall has received relatively little attention in the literature.⁶ Although they exist to a certain extent in standard corpora such as the British National Corpus (henceforth BNC), a far greater quantity and variety of examples can be found using web-based resources. The numbered examples from sections 5.1 and 5.2 are therefore web-attested.⁷ For comparison, examples from the BNC are discussed in section 5.3 below.

5.1 Independence of the postmodifying adverb construction

A typical example is given in (16), where the adverb *temporarily* postmodifies the noun *use* (distinguished from the verb *use*, of course, by the voicelessness of the final consonant):

- (16) In view of your decision regarding Burma the British Government was not making any formal request to you for [the *use temporarily* of Australian troops to defend Ceylon].

Such adverbs are restricted to post-head position: instead of **the temporarily use of Australian troops* we have *the temporary use of Australian troops*, with the premodifier an adjective. The fact that the adverb postmodifier precedes the prepositional phrase *of Australian troops* places it syntactically as an internal modifier of the head noun.⁸

The examples in (17) illustrate the independence of the construction from other construction types:

- (17) (a) [The unique *role globally* of the Australian Health Promoting Schools Association], as a non-government organization specifically established to promote the concept of the health promoting school, is described.
 (b) The NHS and [other health *organisations internationally*] clearly need methodologies to support benefit analysis of merging healthcare organisations.
 (c) Earlham College's modern equestrian center will become even more impressive with [the *addition soon* of an indoor riding and show arena].
 (d) I express my profound disappointment at [the government's *refusal yet again* to take the high road and bring forth a motion to allow parliament to sit in committee of the whole].

Example (17a) shows firstly that the nouns which head this construction are not necessarily deverbal: we do not have **It roled globally*. Secondly, although there is a related adjective *global* which can be used as a premodifier in the NP *the unique global role of the Australian Health Promoting Schools Association*, the meaning of this NP is subtly different from that of the NP in (17a). Whereas in (17a) we are talking simply about the location in which the role is performed (globally as opposed, say, to nationally), the use of the adjective strongly invites the inference that the role is an important one. Example (17b) is similar, but the contrast between *organisations internationally* and *international organisations* is even sharper: the phrase *the NHS and other international health organisations* implies that the NHS is an international health organisation, *whereas the NHS and other health organisations internationally* does not. Example (17c) contains a use of the adverb *soon*: in this case, even though there is a related adjective (see (45b-e) below), this adjective cannot be used as a premodifier: **the soon addition of an indoor riding and show arena*. Finally, in example (17d) we have a postmodifier headed by a morphologically simple adverb, *again*, for which there is no related adjective at all. There is therefore perforce no parallel NP **the government's yet again refusal to take the high road*. The existence of this overlooked but important construction shows that the complementarity claim is simply false.

5.2 Boundaries of the postmodifying adverb construction

It has been claimed, notably by Fu *et al.* (2001) in a study of process nominalisations, that the potential for adverbs to postmodify nouns motivates an analysis in which the noun phrase ultimately contains a syntactic verb phrase as its head. This analysis makes two very clear predictions: (a) the adverbs which occur in the construction should be those which are appropriate to verbal constructions denoting processes; (b) only derived nouns should head the construction. Both these predictions, we claim, are not supported by the evidence.

The boundaries of the postmodifying adverb construction are in fact difficult to define and most probably not sharp. However, as far as the first claim is concerned, the adverbs which we observed fall predominantly into the following semantic groups: (i) temporal

location and extent, frequency, aspectual and serial order; (ii) spatial; (iii) domain; (iv) distributional; (v) degree (maximal). The manner type and the act-related type, which we would expect to occur most naturally in the modification of processes, are strikingly absent.

Firstly, temporal, frequency, aspectual and serial order adverbs occur very frequently, as illustrated in (18):

- (18) (a) In comparing the infection of humans with BSE and the possibility of infection from CWD we can look at [the *situation recently* in England with the Mad Cow Disease outbreak].
- (b) During the early part of last season, it was anticipated that the low markets for stock in the west would materially reduce importation, but [the *revival subsequently* of business] led to a demand for improved stock.
- (c) Industrial action has also resulted in [the *withdrawal indefinitely* of the Corran Vehicular Ferry Service], which links the Lochaber mainland to Ardgour, Ardnamurchan.
- (d) Public awareness of the low birthweight problem is heightened by [the *release periodically* of major reports by a variety of public and private organizations interested in maternal and child health].
- (e) [The *revelation already* of the mobile biological laboratories] is an enormously important development.

In (18a) and (18b) we have adverbs of temporal location: these can be interpreted deictically (*recently*) or non-deictically (*subsequently*). Compare also deictic *soon* in (17c). In (18c) and (18d) there are adverbs of temporal extent (*indefinitely*) and frequency (*periodically*). Compare also *temporarily* in (16). Aspectual and serial order adverbs are also common. The earlier than expected inception of a situation is indicated by *already* in (18e), and repetition by *again* in (17d).

Spatial concepts are not typically expressed by adverbs, but such adverbs as do exist in this area freely occur in the postmodifier construction:

- (19) (a) The eighteenth century miners recognised that they were following in the steps of much earlier workers, an observation that was then linked to [the *discovery locally* of copper ingots bearing Roman inscriptions].
- (b) During the early 1990s [a timber *shortage internationally*] led to an increase in timber prices and export opportunities for premium timber grades.
- (c) An additional feature to this instrument (the Rotation Pegboard Machine) is the capability of [*rotation clockwise and counterclockwise*].
- (d) I shake her and call her name, but the only response is [the *lolling sideways* of her head] and an animal-like grunt.

The derived adverbs in *-ly* which occur in this construction are those with administrative or geographic denotations such as *locally*, *regionally*, *nationally*, *internationally*, *centrally*, and *globally*. Two of these are illustrated in (19a) and (19b), while (17a) includes an occurrence of *globally*. Possibly these should be thought of as a specialised subspecies of the domain type.

However, we must also take into consideration a small number of directional forms ending in *-wise* or *-ways*. Two of these, *clockwise* and *counterclockwise*, can be seen in (19c), while (19d) has *sideways*. Others are *crabwise*, *crosswise*, *edgewise* and *lengthways*. Strictly, this limited set of forms satisfy only our initial test frame for adjective status: they occur as attributive modifiers (*the clockwise rotation*), and not as pre-head verbal modifiers (**the wheel clockwise rotated*). It might be argued therefore that in (19c) *clockwise* is an adjective. However, these forms also occur as post-verbal modifiers (*the wheel rotated clockwise*). Since they cannot reasonably be claimed to be predicative in this position (the direction of rotation is clockwise, not the wheel itself), we can pre-empt a decision of section 8 that they here must have the category status of adverbs. Thus in examples (19c) and (19d) we might potentially have either a post-head adjective modifier or a post-head adverb modifier: the form itself does not tell us. Given the severe restrictions on post-head adjectives, we are inclined to argue that (19c) and (19d) indeed exemplify the postmodifying adverb construction. However, it would in no way affect the general argument if they did not.

Domain adverbs are illustrated in (20):

- (20) (a) These major strides forward have been accomplished due to [the *support financially* of the local community].
 (b) I think one could go back and chart all these things as being milestones in [the *turnaround politically* of the Government's fortunes].

These adverbs are typically derived from adjectives by the suffixation of *-ly* and, if the adjective is represented by X, can be paraphrased by such expressions as *from an X perspective* or *from an X point of view*. The adverb *financially* in (20a), for example, restricts the denotation to a financial domain.

We take distributional adverbs to belong to a specialised type which serves to indicate whether the denotation of a noun applies individually or collectively to one of its arguments. Examples of individualising adverbs are then *individually*, *separately* and *independently*, while collectivising adverbs are *collectively*, *jointly*, *cumulatively* and *generally*. Although distributional is not identified as a distinct semantic subtype of adjunct in *The Cambridge Grammar*, the occurrence of these adverbs in the postmodifying adverb construction motivates a separate treatment. They are illustrated in (21):

- (21) (a) Obtaining the information requested would entail [the *scrutiny individually* of nearly 1,500 written answers] and could be undertaken only at disproportionate cost.
 (b) [The *argument collectively* of these media moguls] was 'efficiency' and the threat of alternate media sources, the Internet and cable industry in particular.
 (c) Indeed, [the *opinion generally* of the doctors who appeared at the hearing] was that each day of delay would further endanger the child.

Maximal adverbs are a subspecies of degree adverb. The maximal adverb which occurs most naturally in the construction is one which, like the forms in *-wise* or *-ways*, does not satisfy the initial test frame for adverb status, and occurs either as an adjectival

pre-head noun modifier or an adverb post-head verb modifier. It is *outright*, as illustrated in (22a–c):

- (22) (a) One difficulty that I have with some thinking of the organic movement is [the *rejection outright* of genetic modification].
 (b) Consolidation since 1996 has been demonstrated by [the *acquisition outright* of the Italian mineral water concern San Pellegrino].
 (c) The saddest accident of the entire tornado-devastated district was [the *killing outright* of three members of the Schmitt family].
 (d) Our goal is the total freedom of the people and children and [the *destroying totally* of the common enemy].

The three occurrences of what we take to be the adverb *outright* have slightly different senses. The occurrence in (22a) is closest in meaning to the maximal adverb *totally*. In the context of nouns denoting financial transactions, as in (22b), it indicates that ownership is not shared. In the context of nouns such as *killing* in (22c), the degree sense is augmented by a temporal one: death was immediate. The semantically similar *-ly* adverb *totally* is occasionally found in examples such as (22d).

The generality of manner adverbs do not seem to fit happily into the postmodifying adverb construction. For example, we can have the NP *my close examination of the patient* but hardly *my examination closely of the patient*. The only attested exceptions we have identified are examples (which we judge to be somewhat marginal) with the adverbs *positively* and *negatively* in conjunction with the head noun *rejection*, as in (23a) and (23b), and examples with the *a*-prefixed adverb *aloud*, as in (23c):

- (23) (a) I am in one of my trauma periods, bleeding gums, pain, [not much *reaction positively* to Lidex gel].
 (b) I think part of [the *reaction negatively* to this] is because sometimes it can be very confusing to the dog as to where they are allowed to go when outdoors and indoors are interchanged.
 (c) In other words, the activity within auditory cortices during [the *reading aloud* of single nouns presented on a video monitor] ('Read') is no different than the auditory activity while passively viewing the same nouns ('Look').

Aloud is hardly a typical manner adverb: it only occurs post-verbally, and *read aloud* is a fixed collocation whose meaning is quite specialised and very distinct from that of *read loudly*. It permits no degree modification: compare **read very aloud* with *read very loudly*. And the contrast with the regular *-ly* adverb *loudly* is clear: *the reading loudly of selected passages*. Possibly *reading aloud* is better treated as a nominalisation of a partially opaque verbal idiom *read aloud*. It would then be similar to nominalisations of phrasal verbs, e.g. *reading out*.

The majority of the examples illustrated above involve NPs which denote events. A test for this would be the ability of the phrase (minus any conflicting adverb) to occur in the frame '— took place/occurred at time X'.⁹ The nouns which head such phrases are typically derived from or related to verbs and aspectually dynamic, e.g. *use* (16), *addition* (17c), *refusal* (17d), *revival* (18b), *withdrawal* (18c), *release* (18d),

revelation (18e), *discovery* (19a), *rotation* (19c), *lolling* (19d), *turnaround* (20b), *scrutiny* (21a), *rejection* (22a), *acquisition* (22b), *killing* (22c), *destroying* (22d), *reaction* (23a,b), *reading* (23c). However, neither of these conditions necessarily holds. We have for example the nouns *situation* in (18a) and *shortage* in (19b). These indeed denote events (we have for example *This situation/shortage occurred last year*). But the events denoted are aspectually stative, and the nouns are not derived from verbs. The noun *situation* is not, for example, synchronically related to the verb *situate*, while the noun *shortage* is derived from the adjective *short*. Nevertheless, in the case of event-denoting nouns, we have a natural explanation at least for the occurrence of temporal and spatial adverbs: the adverbs indicate the time or place of the event just as they would in clauses.

It would not be correct, however, to claim that the construction is restricted to nouns which themselves denote events. The examples with *role* (17a), *organisations* (17b), *support* (20a), *argument* (21b), and *opinion* (21c) suffice to disprove this idea. Further examples are given in (24):

- (24) (a) [The *winner recently* of both a Gramophone award and the Royal Philharmonic Society Award for Best Chamber Ensemble], the Endellion Quartet is renowned as one of the finest quartets in the world today.
- (b) The latest accusations have received comparatively extensive and sympathetic media coverage, indicating a concern in ruling circles over [the *impact internationally* of the publicity surrounding the cases].
- (c) There have been very few fishing opportunities on the west coast due to [the *weather recently*].
- (d) [The *news lately*] has been depressingly full of stories about federal mismanagement of our federal lands.
- (e) [the *quality visually* of the overlay] is top notch!
- (f) [The *centerpiece visually* of the film] is the amazing ten-minute sequence in which Atanarjuat is chased, naked, across the ice by Oki and his friends.
- (g) [The *people locally*] are very supportive of us.
- (h) Many of our members manufacture construction products providing [*buildings internationally*] with structural fire protection.

In examples such as (24a–b) we have nouns which bear a transparent relationship to events: *winner* denotes the agent of an act of winning, while *impact*, like *support* (18a), denotes a result. Arguably *argument* and *opinion* belong in the latter category as results of mental activities. Examples (24c–d) illustrate a category of noun whose denotation is temporally and geographically variable, even if not strictly definable as an event. It includes nouns denoting changing environmental conditions such as *weather*, *temperature* and *climate*, as well as information-denoting nouns like *news* and *intelligence*. In example (24e) we have a category of abstract noun whose denotation is inherently scalar, on a scale of high to low importance or quality. These include nouns derived from adjectives (*significance*, *importance*, *prominence*) as well as nouns such as *quality*, *value*, *profile*, *reputation*, *status* and *role*. The noun *centerpiece* in (24f) illustrates a group of nouns which denote significant parts rather than the abstract property of

significance: others are *highlight*, *key* and *focus*. Finally, examples (24g–h) show that, with spatial adverbs such as *locally* and *internationally*, virtually any noun will fit.

It should be noted then that these examples clearly refute Fu *et al.*'s general thesis that the presence of adverbs in nominals requires the presence of a head noun derived from a verb. It seems implausible therefore that the presence of adverbs as postmodifiers of nouns can be explained away by the postulation of an underlying syntactic VP constituent.

5.3 Postmodifying adverbs in the BNC

As a control for the web-based data, we briefly consider in this section occurrences of the postmodifying adverb construction in the BNC. The precise construction examined was 'the N Adv PP[*of*]', with an *of*-headed prepositional phrase complementing the noun. The total number of genuine examples identified was just eighteen (a rate of 1.8 instances per ten million words). With the restriction to a following PP[*of*], this figure definitely underestimates the total frequency of the postmodifying adverb construction as a whole in the corpus. However, the restriction cuts down to some degree the vast numbers of irrelevant hits.

The adverbs identified fall into the following types, as shown in Table 2.

Table 2. Occurrences of the postmodifying adverb construction in the BNC

TEMPORAL LOCATION	SPATIAL	DOMAIN	DISTRIBUTIONAL	REASON	SERIAL ORDER
6 (33%)	6 (33%)	2(11%)	2 (11%)	1 (6%)	1 (6%)
recently (x3) immediately initially shortly	centrally (x2) nationally (x2) locally (x2)	electorally environmentally	generally (x2)	naturally	again

The full set of examples found is given in (25–30):

(25) TEMPORAL LOCATION

- (a) Another important factor benefiting freight customers was [the *arrival recently* of the Stena Antrim]. [BNC: AMH 698]
- (b) [The *introduction recently* of the 25-pack Royal cigarette] seems to have been very successful. [BNC: K55 2294]
- (c) Instead he points to [the *contribution initially* of PJ McGowan and *more recently* current manager Hugh McCabe] as the men who have offered Fermanagh a new route forward. [BNC: HJ4 6368]
- (d) On Jan. 16 Radio Bangladesh reported that the government had agreed to grant an amnesty which would secure [the *release immediately* of 3,683 prisoners] and the phased release over eight years of a further 9,000. [BNC:HL3 1689]

- (e) Her priorities include giving more encouragement to medical research; emphasis on preventive health to make the NHS a 'health as well as a sickness service', with [the *publication shortly* of new national targets for reducing deaths from heart disease and cancers]; and pressing ahead with care in the community. [BNC: AL5 46]

(26) SPATIAL

- (a) What is noteworthy in the present context is that it was an initiative that was energetically directed by SED and it involved [the *preparation centrally* of curriculum materials for every area of work]. [BNC: CN5 489]
- (b) However, we know that some colleges will be anxious to take advantage of the greater flexibility and relevance of the new-style courses as soon as possible and SCOTVEC is still confident that substantial progress can be made in the current session in [the *development centrally* of the new style course material]. [BNC: HBN 37]
- (c) The view taken by the district on the relative importance of these two needs is likely to be a large influence on the competitive pressures faced by a given unit, as is [the *existence locally* of other public or private providers] and the number of GP budget-holders. [BNC: B2A 1152]
- (d) [The *presence locally* of major electronics assembly plants using modern methods of management and 'just-in-time' techniques] may, for instance, present important market opportunities for local companies. [BNC: HJ1 21066]
- (e) The Polytechnic was anxious to ensure, however, that its commitments to diploma and other work were not overshadowed by the CNAA departure (and it is important in this respect to remember [the *fears nationally* of colleges of art entering into polytechnic amalgamations]). [BNC: HTK 570]
- (f) Only a trickle of progress reports have so far found their way back to Buckinghamshire's education department, but they confirm [the *trend nationally* of a poor overall response and turnout confined principally to a hardcore of parents, generally stalwarts of a school parent-teacher association]. [BNC: G20 101]

(27) DOMAIN

- (a) The research focuses on the interactions between the political system and the industrial relations system; that is, the size of the public sector and the welfare state, [the *strength electorally* of social democratic and left parties], and the participation in government of left parties are all taken into account in trying to explain strike activity. [BNC: HJ0 8280]
- (b) Besides [just the *impact environmentally* of the road], and besides the traffic flows you could get, the generation of traffic that these roads in fact will bring with them [unclear] development. [BNC: J9U 1246]

(28) DISTRIBUTION

- (a) But, she went on: ‘However, in the present era of instant world-wide communication, it would be unrealistic to seek to prevent, whether under existing or amending legislation, the reporting in [the *media generally*] of statements emanating from illegal organisations, whether they purport to issue from Dublin or elsewhere.’ [BNC: HJ4 4939]
- (b) Three or four of us start, er three or four of us talking yesterday, day before yesterday, erm, about the [*attitude generally* of erm students in the, the sixth form, years twelve and thirteen], ... [BNC: KBM 1488]

(29) REASON

Part of [the *richness naturally* of American fiction] is erm that there are so many writers with so many different backgrounds, so many different ethnic backgrounds. [BNC: KRH 2343]

(30) SERIAL ORDER

But into this situation there is [the *intervention again* of Moscow], of Stalin. [BNC: F8R 41]

Although the overall numbers are small, it is clear that the adverbs we have found are almost exactly a subset of those found during the web searches. The one new type found is *naturally* in (29), which we interpret as a very rare case of an adverb indicating reason: *naturally* here can be paraphrased as *by virtue of its nature*. The BNC data allow us to identify TEMPORAL LOCATION and SPATIAL as the most frequent semantic types, and confirm the previous result that MANNER adverbs are somewhat marginal in this construction.

As far as the head nouns are concerned, we also observe a degree of variation analogous to that found in the web searches. There are seven head nouns which denote aspectually dynamic events and are derived from verbs: *arrival* (25a), *introduction* (25b), *release* (25d), *publication* (25e), *preparation* (26a), *development* (26b) and *intervention* (30). However the rest are not of this type. In *trend* (26f), we have an event-denoting non-derived noun. The nouns *existence* (26c) and *presence* (26d) conceivably denote non-stative events, but are derived from adjectives. The nouns *contribution* (25c) and *impact* (27b) are result rather than event nominalisations. The nouns *attitude* (28b) and *fears* (26e) denote mental states. The nouns *strength* (27a) and *richness* (29) are non-event-denoting scalar nouns derived from adjectives, and *media* (28a) is a non-derived information-denoting noun similar to *news* in (24d).¹⁰

The conclusion is then, as before, that the types of adverb and the types of head noun that we find in the postmodifying adverb construction are not predictable on the basis of an underlying syntactic VP. The main adverb types that we would most certainly expect to find under such an analysis, namely manner and act-related, are precisely the types which do not occur.

5.4 Contrast with adjectives

We noted in the discussion of our introductory example, (16), that adverbial modification of nouns is restricted to post-head position. Most of the examples have been of adverbs in *-ly*, and these are systematically excluded from pre-head position. Of the others cited, *again*, *already* and *soon* likewise occur only after the head. *Outright*, *clockwise*, *counterclockwise* and *sideways* can occur as pre-head modifiers (*an outright villain*, *a clockwise direction*, *sideways movement*, etc.), but our criteria have led us to follow traditional practice in treating these as dually classified items, belonging to the adjective category when preceding the head. Although they are wholly or largely restricted to modifying as opposed to predicative function (cf. **That villain is outright*), this must be preferable, given the small number of items involved, to treating them as exceptional adverbs when they precede the head noun.

While adverb modifiers of nouns are thus restricted to post-head position, the situation with adjectives is less straightforward. In the simplest cases, of course, they are restricted to pre-head position, so that we have, for example, *an international shortage*, not **a shortage international*. There is, however, no complete ban on post-head adjectival modifiers, and it is possible to find pairs of examples where corresponding adjectives and adverbs occupy post-head position. The examples in (31) are again web-attested:

- (31) (a) If you choose to redeem before the contract matures, you will receive [the *value current* at the time], minus any penalties.
 (b) Investments in any bond proffered by USIS Inc. are deductible in the year paid or accrued, less [the *value currently* of any bond received by the investor].

The cases where adjectives are permitted in post-head position are illustrated in (32):

- (32) (a) *something useful*; *someone energetic*
 (b) the *stars visible*; the *members present*; the best *outcome possible*; the *president elect*; the *city proper*; the *ones asleep*
 (c) his *burial alive*; the *rendering safe* of identified explosives
 (d) a *surplus bigger than we'd expected*; a *neighbour keen on gardening*; a *journey hazardous in the extreme*; a *ticket no longer valid*
 (e) *comments both favourable and critical*; *volunteers young or old*

These clearly divide into two distinct types. In types (32a–c) we have special constructions in which a single adjective is permitted to occur in post-head position. In the (32a) examples the adjective functions as postmodifier to a compound determinative in fused determiner-head function: precisely because of the fusion, the adjective cannot occupy its default position between determiner and head. As we have seen, these compound determinatives do not take adverb postmodifiers. The examples in (32b) are illustrative of a highly restricted construction with single word adjectival postmodifiers—the items concerned are specified lexically (compare, for example, *the ones asleep* and **the ones sleepy*).¹¹ In (32c), a more productive type of construction noted by Jespersen (1913: 292), we have adjectives functioning as predicative complements

in nominalisations. The predicative function will of course in this case obviate any possibility of contrast with the adverb postmodifier construction.

The second type is illustrated by the constructions in (32d–e), and these do provide crucial evidence against the complementarity claim. They both involve cases where standard attributive adjectives, with the standard semantic interpretations permitted in attribution, are forced to occur in the post-head modifier function because of their internal syntactic complexity. In (32d) the postmodifying adjective is accompanied by its own dependent—a post-head complement in the first two examples, a post-head modifier in the third and (less commonly) a pre-head modifier in the last. Finally in (32e) we have coordinations of adjectives. Adverbial modifiers can of course also take their own dependents and enter into coordinative constructions, so that adjectives and adverbs can occur, to a limited extent, in the same structural context:

- (33) (a) the addition *sooner than had been expected* of an indoor riding and show arena (cf. (17c))
 (b) a surplus *bigger than had been expected*
- (34) (a) shortages *both nationally and internationally* of these metals (cf. (19b))
 (b) shortages *both national and international* of these metals

Example (34) thus represents a grammatically impeccable minimal pair contrasting adverbs and adjectives in the postmodifier function.

Finally, the semantic difference between the postmodifying adjective and post-modifying adverb constructions can be seen in the contrast between (35a) and (35b):

- (35) (a) smokers *both heavy and light*
 (b) *smokers *both heavily and lightly*

While the adjectives *heavy* and *light* can semantically access the underlying predicate of smoking (they can be ‘tertiary’ in Jespersen’s terminology), the corresponding manner adverbs *heavily* and *lightly* cannot. The semantic interpretation permitted in (35a) is convincing evidence that this construction should be considered as functionally identical to the pre-head attributive adjective construction, the pre-head or post-head position being simply determined by the syntactic complexity of the attribute.¹²

6 Adjectives modifying adjectives

The possibility that adjectives might function as modifiers of other adjectives is also not one that is contemplated by *The Cambridge Grammar*. Instead, when such a modifier has the same form as an adjective, it is analysed as a homophonous adverb. There may however be grounds for overturning this decision in those cases where it is not necessary to posit the existence of a homophonous adverb independently as a verb modifier. This applies in pairs such as *reject outright/outright rejection* (see section 5.2 above, and *The Cambridge Grammar*: 567–9 for further examples).

The cases to consider in the present context are illustrated in (36–7):¹³

- (36) (a) blind drunk, cold sober, plain daft, sore afraid, squeaky clean, filthy rich, pretty fine, jolly good, bloody stupid
(b) dead easy
- (37) (a) mad keen, anal retentive, silky smooth, pure archaic, repetitive boring, black British, traditional Irish
(b) worldly wise, deadly serious, nuclear capable, modern bright, damn stupid, red hot, white hot, red raw

In (36), we have a number of collocations in which the modifier has the same form as a regular adjective, i.e. one which can be used attributively or predicatively, but has a clearly specialised meaning, typically one of maximal degree. For example, someone who is blind drunk is exceptionally drunk, but not necessarily blind as a result. The collocations found here are of varying productivity: in contrast to *blind*, modifiers like *pretty* or expletive *bloody* can co-occur with a huge variety of adjectives. When, as in the (36a) but not (36b) examples, the regular adjectives have corresponding adverbs in *-ly*, contrasts arise, for example:

- (38) (a) The assassin was cold sober/coldly sober.
(b) This conclusion is plain daft/plainly daft.

In (38a), *cold sober* means ‘totally not inebriated’, but *coldly* in *coldly sober* denotes the calculating nature of the assassin’s sobriety, most plausibly in the metaphorical sense of ‘coldly rational’. Similarly, *plain daft* means ‘extremely daft’, whereas *plainly* in *plainly daft* has the more literal meaning of ‘obviously daft’.

What are we to make of such contrasts? If we accept the conclusion of *The Cambridge Grammar* that the modifiers *cold*, *plain* etc. are adverbs in such collocations, then there is merely a contrast between two adverbs with possibly related but different meanings. However, if we were instead to take these modifiers as adjectives, the complementarity claim would be falsified. One reason for thinking that what we in fact have here is an independent, albeit collocationally restricted, Adj + Adj construction is that the modifier must be in immediate construction with the head; no standard adverb can intervene. Compare **cold very sober* with *coldly very sober*, or **blind very drunk* with *blindly very drunk*. With the expletive *bloody*, the construction can iterate: *cold bloody sober*, but not **cold bloody very sober*. The immediate construction property holds of all the forms in (36–7).

The examples in (37a) are ones in which the meaning of the modifier in the collocation is essentially the same as that of a regular adjective, or at least one sense of a regular adjective. For example, the *mad* in *mad keen* has essentially the same meaning (‘enthusiastic’) as the *mad* in *mad about football*. As before, in the (a) examples, an adverb in *-ly* exists. In some cases, the adverb in *-ly* could be chosen rather than the form without it. For example, *madly keen* can have more or less the same sense of ‘very keen’ as *mad*

keen. and *anally retentive* could be used just as well as *anal retentive* as a description of the psychological type. However, the adverbs in *-ly* could be given a more literal interpretation, in which case a similar contrast arises as in the (36a) examples above. In other cases there is a clear motivation for not using the *-ly* form. Compare (39):

- (39) (a) Her hair was silky smooth/silkily smooth.
 (b) The décor looked pure archaic/ purely archaic.
 (c) His humour was black British/blackly British.
 (d) My new job is boring repetitive/boringly repetitive.

The choice of *silky* rather than *silkily* in (39a) is strongly motivated by the interpretation 'like silk' which we find in the regular adjective (compare *silky hair*). This can be contrasted with the interpretation imposed by the form *silkily*, which would be 'smooth in a silky manner'. In (39b), the choice of *pure* is motivated by contrast with the focussing adverb *purely*, which has a possible meaning 'exclusively'. Rather, the décor itself is pure. The *black* in *black British* in (39c) is of course a racial term, and contrasts sharply with the adverb *blackly* meaning 'gloomily'. And in (39d), the job is boring because it is repetitive, and not repetitive in a boring manner. In such cases as these, the argument that the modifier without *-ly* is an adverb homophone of the regular adjective looks very insecure. Rather, an adjective-like meaning is deliberately being selected in opposition to an adverbial one. Examples such as *boring repetitive* seem to be made up on the fly, and illustrate the productivity, albeit limited, of what we are now taking as the Adj + Adj construction.

Finally, the examples in (37b) are ones in which the modifier has the same form and meaning as the regular adjective, and where no corresponding adverb in *-ly* exists. In such cases, we can now see that it would be otiose to posit the existence of homophonous adjective and adverb forms. These are simply further examples of the Adj + Adj construction.

We conclude this section with a brief discussion of the modification of colour terms, as in (40):

- (40) (a) deep red, dark red, light red, dull red, brownish red, pearlescent red, fiery red
 (b) bright blonde, pale blonde, silvery blonde, faded blonde, streaky blonde

These look to be clear examples of the Adj + Adj construction, and indeed we will argue that they are so. A complication arises however from the fact that in English all colour terms can clearly be nouns. As well as (41a), we also have (41b):

- (41) (a) Her hair was bright, silvery blonde.
 (b) Her hair was a bright, silvery blonde.

It would appear to be incontrovertible that *blonde* in (41b) is a noun, and predictably it does not accept adverb pre-head modification: **a brightly blonde*. But what about *blonde* in (41a)? Could this not be the noun also? The omission of the article would be comparable in that case to the omission of the article with predicative nouns of material composition, as in *This shirt is cotton*. Two arguments lead us to think however that the

form in (41a) is nevertheless an adjective. Firstly, it accepts adverb modification, leading to contrasts such as (42):

- (42) a. Her hair looked pale blonde/palely blonde in the moonlight.
 b. Her hair looked ?dim blonde/dimly blonde in the moonlight.

The force of *palely* in (42a) is akin to that of *dimly* in (42b), whereas modification of *blonde* by the adjective *dim* is not an established collocation. Secondly, the Adj + Adj combination itself accepts adverb modification, as in [*very* [*silvery blonde*]], or especially clearly in examples like [*very* [*Prussian blue*]], where the adjective *Prussian* is itself ungradable.

In this section, we have given a number of examples of the Adj + Adj construction, where an adjective modifies another adjective. Some of these are very familiar and well-established collocations, while others are concocted on the fly. Sometimes there is a contrast with the construction in which an adverb modifies the adjective, and sometimes not. But this is another case where we cannot simply predict on the basis of the modified category alone that the modifier belongs to one category rather than the other.

7 Internal complement

In this section, we group together the cases where an adjective or adverb functions as an internal (i.e. VP-internal) complement. There are in fact three cases to consider here: (i) ascriptive, (ii) specifying, and (iii) non-predicative. In *The Cambridge Grammar* the first two are grouped under the heading ‘predicative complement’, while the third is unnamed. The first two are very productive, while the third is restricted to a handful of complements of the verb *be*; we will call it here simply ‘non-predicative’. We note the distinctions made between the three types are essentially semantic, and not syntactic, under the terms of the complementarity claim. VP-internal complement then provides some further examples of non-complementarity.

7.1 Ascriptive

The term ‘ascriptive’ applies when the function of the internal complement is to denote a property which is valid of the entity denoted by the predicand (typically a subject or object).¹⁴ In this case, an adjectival form must be chosen. The verbs which take such complements can be either intransitive, for example *be*, *become*, *appear*, *seem*, *look*, *smell*, *sound*, or transitive, for example *consider*, *want*, *drive*. The contrast between the function of ascriptive predicative complement and that of verb modifier of course accounts for superficially minimal pairs such as Lyons’ *She smells nice/nicely*, or (43):

- (43) (a) I want her *desperate* ADJ [PREDICATIVE COMPLEMENT]
 (b) I want her *desperately* ADV [MODIFIER OF V]

The interpretation in (43a) is ‘I want her to be desperate’, while in (43b) the adverb is a manner adverb modifying the verb.

In order to preserve the correspondence between ascriptive predicative complements and adjectival forms, *The Cambridge Grammar* notes that there are certain cases where the ability to function ascriptively motivates the reanalysis of a traditional adverb as belonging to both adverb and adjective categories. Take *how*, for example:

- | | | |
|--------|------------------------------------|------------------------------------|
| (44) | ADVERB | ADJECTIVE |
| (a) i. | <i>How</i> did you get in? | ii. <i>How</i> was the concert? |
| (b) i. | <i>How</i> serious is the problem? | ii. <i>How</i> are you? |
| (c) i. | <i>How</i> often do you see them? | ii. <i>How</i> did it seem to you? |

In the (44i) examples *how* is a modifier – of a verb (phrase), adjective and adverb – and uncontroversially an adverb. In (44ii), however, it is a predicative complement, and although traditional grammars and dictionaries analyse it as an adverb here too it is surely more appropriately classified as an adjective. In answers to the (44ii) questions *how* is characteristically replaced by an adjective: *It was excellent*, *I'm fine*, *It seemed plausible*. Typical adverbs marked by the *-ly* suffix are excluded from such answers, just as they are in (7bii). And note that traditional grammars assign *well* to both categories: an adjective in answer to (44bii), an adverb in answer to *How did it go?*, etc. The failure to recognise *how* as an adjective reflects the focus of the definitions in (3) on the modifying function, for *how* does not occur as an attributive modifier of nouns. But traditional practice of course also allows for adjectives (such as *asleep*, *content*, *liable*, *rife*, etc.) that are used predicatively but not attributively: there is no reason why *how* should not be included among this subset of adjectives.

The same applies to *soon* (though this was not noted in *The Cambridge Grammar*). Compare (45), where all examples but the basic (45a) are web-attested:

- (45) (a) They'll be arriving *soon*.
 (b) In any case, it seems too *soon* to worry.
 (c) I know it may seem *soon* to be unleashing yet another 1980's teen comedy after 'Back to the Future' just last week.
 (d) Tomorrow had seemed *soon* enough to have to confront her relatives.
 (e) Six weeks later seemed *soon* enough when we scheduled these tests.

Traditional grammars and dictionaries uniformly classify *soon* as invariably an adverb. That works for (45a), but not for (45b–e). We use the verb *seem* here rather than *be* to make the point even more clearly. In their discussion of the distinction between adjectives and adverbs, Quirk *et al.* (1985: 404) give the ability to occur as predicative complement of *seem* as one of their two major criteria for adjectives – and use *soon* as one of the two examples illustrating the adverb category, which they say lacks this property. As evident from the attested examples in (45b–e), however, *soon* does occur as complement to *seem*. The impersonal construction in (45b), with *soon* modified by *too* and followed by an infinitival clause licensed by this *too*, is quite common, and there is no doubt about the acceptability of the other examples either. *Early* is an uncontroversial example of an item belonging to both adjective and adverb categories, differing from *soon* in its ability to function as attributive modifier of a noun; if it were substituted for *soon*

in (45b–e) it would surely be taken as the adjective *early*, not the adverb, and *soon* here should be analysed in the same way.

7.2 Specifying

Adverbs (or AdvPs), like most other categories, can occur as complement to *be* in its specifying sense. Examples are given in (46):

- (46) (a) The only way to do it is very, very *slowly*.
 (b) It was only *recently* that I realised what she had done.

Semantically, the function of the complements here is not ascriptive: they do not ascribe a property to a predicand. In example (46b) we have an occurrence of specifying *be* in the cleft construction. As noted in *The Cambridge Grammar*: 1420, n.31, the verb *seem* can also function in this way, as shown in the web-attested examples in (47):

- (47) (a) It seems only *recently* that I have begun to figure out who I am.
 (b) It doesn't seem very *often* that someone loves their jobs these days.

This specifying use of *seem* seems restricted either to complements which denote recent times, whatever their category, or to the adverb of frequency *often*. Compare for example *It seems only a few days ago that she was a perfect picture of health* with **It seems around 9pm that they arrived*.

Since no adjective denotes a recent time, and *often* has no parallel adjective form, there is no possibility of direct contrast with the adverbs in (47). But contrasts such as those in (48) must be treated as semantic contrasts between ascriptive and specifying complements:

- (48) (a) i. The way she dressed [ASCRIPTIVE COMPLEMENT]
 was *elegant*.
 ii. The way she dressed [SPECIFYING COMPLEMENT]
 was *elegantly*.
 (b) i. It was *rude* that she [ASCRIPTIVE COMPLEMENT]
 answered me back.
 ii. It was *rudely* that she [SPECIFYING COMPLEMENT]
 answered me back.

This is then a clear case of non-complementarity under the terms of the complementarity claim.

Adjectives also however occur as complements of specifying *be*, giving rise to further contrasts as in (49):

- (49) (a) It was *desperate* that I wanted her.
 (b) It was *desperately* that I wanted her.

The form which is chosen for the foregrounded element is obviously related to the function required in the corresponding non-cleft clauses: *I wanted her desperate* in the case of (49a) and *I wanted her desperately* in the case of (49b). But now it is not possible

8 External modifier

External modifiers of NPs are predominantly adverbs (or adverb phrases). They include not only focussing adverbs such as *quite* in Sweet's example *quite a gentleman*, but also a variety of adverbs in *-ly*:

- (53) (a) He had done it for [*exactly* the wrong reason].
 (b) It was written by [*probably* the least qualified member of the panel].
 (c) She had endured it with [*barely* a complaint].

However, a limited range of adjectives and AdjPs occur as external modifiers preceding the indefinite article. These include *such* and exclamative *what*, as well as AdjPs introduced by the degree modifiers *as*, *so*, *how*, *too*, *this*, *that*, *more* and *less*.

- (54) (a) He was [*such* a baby].
 (b) It was [*as perfect* a soufflé as he could manage]
 (c) [*How serious* a disaster] is it?

A full description of both these constructions can be found in *The Cambridge Grammar*: 435–9.

The external modifier function is therefore not one in which we can straightforwardly predict whether an adjective or adverb will be selected. We cannot ultimately base this selection on the choice of determiner, since not only adjectives but also adverbs occur with a following indefinite article, as shown by example (53c). Nor can we ultimately base this selection on the fact that the majority of adjectival modifiers have degree modification: adverbs too allow basically the same degree modifiers. Quite interestingly, too, the distinction between adjective and adverb cannot ultimately be related to any semantic notion of predication. We noted above Jespersen's point that adjectives can operate as modifiers with a 'tertiary' as well as a 'secondary' interpretation. An adjectival external modifier is no more necessarily 'secondary' in its semantics than an attributive modifier (or post-head modifier of N for that matter). For example, an adjective like *heavy* can be used as a 'tertiary' attributive modifier in *a heavy smoker* (in the sense 'one who smokes heavily'), and likewise as a 'tertiary' external modifier in *as heavy a smoker as you are likely to meet*. While it is possible to say that the adjective must be chosen when the external modifier is 'secondary', it will not do to say that the adverb must be chosen when the external modifier is not 'secondary'.

It is, we believe, only a conspiracy which frustrates the construction of absolutely minimal pairs on a wide scale. Given the restrictions on the adjective construction, a minimal pair would have to include as one example a noun phrase involving the indefinite article and an adverb functioning as external modifier with the appropriate degree modification. Most typically, adverbs as external modifiers occur with definite NPs like those in (53a–b), and examples like (53c) with the indefinite article typically occur with non-gradable adverbs. If we add a degree modifier, adverbs as external modifiers are grammatically impeccable with definite NPs like those in the web-attested

(55a). Comparable examples with the indefinite article are however not totally excluded, as shown by the web-attested (55b):¹⁷

- (55) (a) The joke is commonly based on incongruity—looking at one thing in [*so obviously* the wrong context or category that it helps to reinforce the category it pretends to disrupt].
 (b) It was interesting to see my Leslie, in [*so obviously* a feminine setting], speak about her hair as if she had been doing so from birth.

In examples like (55b), the adverb contrasts directly with the adjective: we also have *in so obvious a feminine setting*. The choice between adjective and adverb as external modifiers cannot therefore be reduced to a mere difference in grammatical function.

9 Adjunct

Here we group together all the cases which involve the function of adjunct. The term ‘adjunct’ in *The Cambridge Grammar* covers modifiers in the VP or clause, as well as related ‘supplements’ which are not integrated into the syntactic structure and are prosodically detached. The main reason for treating adjuncts separately is that these, unlike the modifiers of non-verbal categories, can be either ascriptive (predicative) or non-predicative. This leads to contrasts such as those in (56):¹⁸

- | | | | |
|-------------|---|-----|-------------------------------------|
| (56) (a) i. | The passengers arrived <i>safe</i> . | ADJ | [ASCRPTIVE MODIFIER
IN VP] |
| ii. | The passengers arrived <i>safely</i> . | ADV | [NON-PREDICATIVE
MODIFIER IN VP] |
| (b) i. | <i>Weary</i> , we made our
way home. | ADJ | [ASCRPTIVE
SUPPLEMENT] |
| ii. | <i>Wearily</i> , we made our
way home. | ADV | [NON-PREDICATIVE
SUPPLEMENT] |

Whereas the adjectives *safe* and *weary* are directly predicated of the subject in (56ai–bi), the corresponding adverbs in (56aai–bii) function straightforwardly as manner adjuncts. The difference in ascriptiveness here determines the choice, but all the examples are adjuncts and therefore yet more counterexamples to the complementarity claim.

10 The single category claim

In section 1, we noted that in recent years the notion that complementarity exists between adjectives and adverbs has typically been used as an important argument in support of the single category claim, the notion that adverbs are simply inflectional variants of adjectives and that adjectives and adverbs therefore form together a single major category. In the following sections, we have argued that the complementarity claim, in the way that it is formulated, is false. But does the distribution *per se* of adjectives and adverbs have any bearing on the single category claim? In fact, we believe not.

First of all, the pattern of distribution we have observed in adjectives and adverbs is quite similar in principle both to that of distinct major categories, and that of inflectional variants of a single major category. For example, there are clearly environments which we use as criterial in distinguishing between major categories such as noun and adjective, i.e. where major categories are in complementary distribution. But there are also environments, for example, when noun and adjective occur following the verb *be*, where they contrast. Compare the noun in *this is wood*, implying manufacture from wood, with the adjective in *this is wooden*, implying the attribution of wood-like properties. On the other hand, case variants of nouns, which are usually considered as prototypical exemplars of inflectional paradigms, often show the same kind of pattern. A very clear example is the distinction between nominative and instrumental case forms of nouns in Russian. Only a nominative form such as *soldat* (soldier.NOM) can function as a subject, and only an instrumental form such as *soldat-om* (soldier.INST) can occur as complement of the comitative preposition *s* ‘with’, as in *s soldat-om* (with soldier.INST) ‘with the soldier’. But the nominative and instrumental forms contrast in predicative function: we can have both *on byl soldat* (he was soldier.NOM) and *on byl soldat-om* (he was soldier.INST), both meaning ‘he was a soldier’, but with the case distinction carrying a subtle distinction of permanent or temporary state.

Clearly, in these cases where the same forms are complementary in some environments and contrastive in others, it is not the distribution *per se* which leads us to think of a derivational relation between *wood* and *wooden*, and an inflectional relation between *soldat* and *soldat-om*. And even if, as a thought experiment, *wood* and *wooden* on the one hand and *soldat* and *soldat-om* on the other always stood in complementary distribution, would this alter our decision? We think not: it seems that factors other than simple distribution are the crucial ones.

We next therefore briefly consider a range of further arguments which have been adduced in favour of the single category claim.

- (i) The suffix *-ly* is ‘syntactically relevant’ (Plag 2003: 195).

The criterion of ‘syntactic relevance’ is, according to Anderson (1982) in an influential survey of the distinction between inflection and derivation, the key criterion (rather than productivity, on which see below). The definition of syntactic relevance that Anderson (1982: 587) gives – properties are ‘syntactic’ in the relevant sense insofar as they are assigned to words by principles which make essential reference to larger syntactic structures – certainly encompasses a lot of traditional inflectional morphology, in particular anything to do with agreement. The Russian cases would clearly be inflectional under this criterion, since there is case agreement between head nouns and their determiners and modifiers. But Anderson is careful to specifically exclude from the definition ‘properties of lexical insertion *per se* and concomitant principles of subcategorization, etc.’ (1982: 588). Plag wishes to argue that it is the syntax which determines whether forms in *-ly* are employed, and therefore that *-ly* is syntactically relevant in Anderson’s intended sense. But once we pass beyond the clear case of categories which are involved in agreement, it is far from obvious how the ‘syntactic relevance’ criterion should be applied: after all, whether any category can be used

in a particular function in a particular construction is in some sense dictated by the syntactic configuration which defines that construction. We might say that the choice of accusative case noun forms in the context of a transitive verb is dictated by the syntax. Morphological case of course is universally treated as an inflectional category (see Booij 2005: 99–114 for general discussion). But we could equally say that the choice of a derived noun rather than a verb in the context of a determiner is dictated by the syntax. Certainly, adverbs do not enter into agreement relations with other categories in English, and a narrow interpretation of Anderson's criterion does not help. Beyond this, without prior knowledge of whether adverbs form a distinct word class, we fail to see how the syntactic relevance criterion might decide the issue one way or the other.

- (ii) The affix *·ly* is fully productive (a property of inflection as opposed to derivation)

This argument is rarely explicitly stated, but see Bybee (1985: 84) and Plag (2003: 196). The idea is that, as a consequence of the obligatoriness of inflectional marking, inflectional affixes tend to be more productive, i.e. capable of forming new words, than derivational ones. Productivity is however a rather weak criterion to distinguish between inflection and derivation in a principled way: many clearly derivational affixes, e.g. *·ness*, are highly productive (Anderson 1982, Plag 2006: 538).

- (iii) The suffix *·ly* and the comparative and superlative inflections are mutually exclusive: **simplier/*simpliest* (Hockett 1958: 210). Therefore *·ly* is also inflectional.

This morphological argument appears to be the first argument in favour of the single category claim for English. For extensive discussion of this point, and of the general point that inflection occurs outside derivation, see Zwicky (1989, 1995). Zwicky notes in particular that there are many clearly derivational suffixes which are equally incompatible with the morphological comparative and superlative, e.g. *·ic*: **basicer*.

- (iv) Adverbs formed with *·ly* never participate in derivation.

Adverbs formed with *·ly* never participate in further derivation: from *quickly* we do not get **quicklyish*, **quicklitude*, **quickliment*, or any other derivatives at all (Plag & Baayen 2009). We do get words like *friendliness*, but that is based on the adjective *friendly*, which is formed with the adjective-deriving *·ly* suffix. Heinz Giegerich (p.c.) points out that this might be regarded as an argument in favour of the inflectional character of adverb-forming *·ly*, since if *·ly* were inflectional the prohibition on derivation would just be a special case of the failure of lexical word formation to apply to inflected stems. Zwicky (1989: 524) has a similar point in mind when he adduces the principle that 'morphemes in rim position are inflectional', though his discussion appears to be directed primarily at argument (iii) above, the resistance of *·ly* to further inflection. Giegerich further observes that a derivational view of *·ly* would make the adverb class unusual amongst other open classes (noun, verb, adjective) in its formation by a single affix resistant to further derivation.

We agree that adverb-forming *-ly* fails to be followed by other derivational suffixes. However, Plag & Baayen (2009) show that the ability of derivational suffixes to be input to subsequent derivational processes is essentially a matter of degree, and that there are other clearly derivational suffixes which are just as resistant as *-ly*, e.g. the noun-forming affix *-ful* in examples like *cupful*. For us, therefore, the differential property of the adverb category lies in the predominance of the suffix *-ly*, rather than in the resistance of this suffix to further derivation.

Further, the adverb category is not limited to forms in *-ly*. Other word-formation processes are involved (see *The Cambridge Grammar*: 566–7), and there are a substantial number of morphologically simple items. And, just as a few morphologically simple adverbs inflect for grade (e.g. *sooner*, *louder*), some also form derivatives. By suffixation, we have for example *soon* ~ *soonish*; *seldom* ~ *seldomness*, *often* ~ *oftenness*; by prefixation — *seldom* ~ *unseldom*, *ever* ~ *never*, by compounding — *oftentimes*, *however*. Certainly, this is rare and sporadic. But so are derivations (and inflections) based on prepositions or determinatives. The relevant generalisation is that lexical word-formation in English applies only to noun, verb, and adjective stems and hardly at all to stems belonging to the lesser categories like adverb, preposition, or determinative. None of this adds up to a case for *-ly* being inflectional.

(v) The affix *-ly* derives adjectives as well as adverbs (Baker 2003)

It is true that in addition to being the form relating adverbs and adjectives, the affix *-ly* derives adjectives like *worldly*, *manly*, and *daily* from nouns.¹⁹ But this supposed argument seems startlingly irrelevant: many superficially similar forms in English morphology have multiple functions. From the fact that *-en* forms adjectives from nouns (*wood* ~ *wooden*) as well as verbs from adjectives (*wide* ~ *widen*), we surely cannot conclude that verbs and adjectives belong to the same category. Indeed, the notion that *-ly* is the same affix in both functions would refute the general supposition behind the single category claim, since the formation of *worldly* (adjective) from *world* (noun) must be derivational.

(vi) Both adjectives and adverbs co-occur with the degree words *how*, *so*, *as*, *too*, *more*, *less*, *enough* (Emonds 1976, Baker 2003).

This is essentially an argument from syntactic similarity. But the picture is more complex than a simple statement allows. While it is true that verbs and nouns do not co-occur with some of these modifiers, gradable verbs do co-occur with *more*, *less* and *enough*: *I no more like her than you do*; *She didn't study enough*. More importantly, however, degree words such as *so*, *how*, *as* and *too* co-occur with PPs denoting states: *I felt so out of sorts*; *He was too over the moon to care*. And if, as in *The Cambridge Grammar*, items such as *near*, *far* and *close* are analysed as prepositions, and *many*, *much*, *few* and *little* as determinatives, even comparative and superlative morphology is not restricted to adjectives and adverbs. Category alone is simply not the determining factor here: the degree words cited modify words in a variety of different categories.

(vii) Adverbs, like attributive adjectives, do not take complements (Baker 2003)

Just as **a proud of his daughter man* is ungrammatical, so too is **John proudly of his daughter showed everyone his photo album*. Here Baker's argument turns that of Jackendoff (1977) on its head: Jackendoff held (incorrectly) that the ability to take complements is the key property distinguishing adjectives from adverbs. Baker is saying that neither category takes complements. But it is surely not justifiable to consider adjectives solely in attributive modifier position. Adjectives do take complements more freely than adverbs do, and the syntactic position in which they then largely occur is the postmodifier position: *a man proud of his daughter*. It is impossible to rescue **proudly of his daughter* by changing its position with respect to the verb (**He smiled proudly of his daughter*). It should also be noted that the restriction on complements in phrases with an attributive function is not specific to adjectives. It also applies to verbal participles: compare *the attacking forces* with **the attacking the bridge forces* and *the forces attacking the bridge*. We would not want to argue from this that verbs lacked the ability to take complements.

(viii) Parallelism between clauses and nominalisations (Baker 2003)

The role of the adverb in *Italy brutally invaded Albania* is parallel to that of the adjective in *Italy's brutal invasion of Albania*. This is true enough, but since the same argument could be used to place the verb *invade* and the noun *invasion* as variants of the same category, a view which has been rejected ever since Chomsky (1970), it cannot be the basis for a categorisation argument.

(ix) Order of adjectives parallels order of adverbs (Baker 2003)

The argument in this case is based on a supposed similarity between the statement of attributive adjective order in Cinque (1994) and the claims about adverb order in Cinque (1999). At a detailed level, however, these statements do not coincide: categories which seem relevant to the order of adjectival modification, such as size, age, shape and colour, are not relevant to clause structure. What is more, Cinque claims a rigid and universal order for adverb modification, based on a hierarchy of clausal functional projections of tense, mood and aspect. Detailed arguments against Cinque's position concerning the association of adverbs with a fixed hierarchy of functional heads are provided by Ernst (2002). As far as the comparison with adjectives is concerned however, there may be a natural order, but it cannot be claimed that it is a rigid one. A noun phrase like *a cherry-red huge SUV*, with colour preceding size, is no less grammatical than *a huge cherry-red SUV*, even if the latter represents the natural order.

(x) Adverbs have the same form as adjectives in some languages (Baker 2003)

Baker cites Edo, Mapuche and Kilega as instantiations of this claim. English also has a number of items which have the same form as adjectives and as adverbs, for example *hard* in *a hard worker* and *she works hard*. One can perhaps imagine that there might be languages where this was always the case. But identity of form is not a sufficient reason for assuming identity of category. In some languages, noun roots have the same form as verb roots, but there are good reasons for distinguishing nouns from verbs syntactically; see Schachter (1985). It is relevant to note that Schachter also observes that there is a

cross-linguistic tendency for adverbs (or subsets thereof) to have certain phonological properties that distinguish them from other words. In Yoruba, for example, all adverbs are in this sense ‘ideophonic’, whereas only relatively few nouns, verbs and adjectives are.

- (xi) Languages without an open class of adjectives do not have an open class of adverbs (Baker 2003)

The language which Baker uses to illustrate this claim is Mohawk, which expresses adjectival and related adverbial concepts by means of stative verbs. Mohawk does, however, have a closed class of adverbs: Baker himself notes adverbs of intensity and frequency. This conjecture is an interesting one, which deserves further investigation. Even if true, however, it would only demonstrate the diachronic relatedness of large adjective and adverb categories, not their identity.

Our conclusion from all the above arguments is that, at the very least, no cogent case has been made for the inflectional status of the affix *·ly*. However, are there any grounds for arguing more positively that adverbs indeed form a distinct major category, and that *·ly* is therefore perforce derivational? It is this question that we address in the following section.

11 Conceptual basis of adjective and adverb

Our strategy in this section is to argue that adverbs have a conceptual basis which is distinct from that of adjectives. The first part of the argument is analogous to the typological argument, pioneered by Dixon (2004 and earlier work), that the adjective category has a conceptual core which is distinct from that of either nouns or verbs, and which leads to the identification of distinctive adjective categories of varying sizes in different languages (distinctive, that is, from major categories such as noun and verb). The core set of concepts which are observed in the adjectives of languages which have a small adjective category are expanded on by languages with larger adjective categories. Typological work on adverbs proper (rather than on the generality of adverbial expressions of varying categories) is very limited, but we adduce one language, Palauan, which has a very small distinct set of adverbs. We identify the core concepts involved in these adverbs, and observe how the concepts observed in English adverbs expand on this core set. Most importantly, the core and expanded sets involved in adjective and adverb categories are rather different.

The typological argument is augmented by a token frequency argument: namely that the core of a category will be reflected in the frequency of use of its members (see a comparable analysis of adverbs in Italian by Ramat and Ricca 1998). An important result which emerges from this frequency investigation, based on the BNC, is that the typological and frequency arguments are quite consistent. What is more, the most frequent items in the adverb category are not items formed with *·ly*. The importance of these items as an argument against an inflectional analysis was noted by Zwicky. According to Zwicky, they are not ‘extraordinary’ adverbs, but ‘central, prototypical, defining members of their (sub)categories’ (Zwicky 1995: 532). Zwicky argues that it

would be perverse to consider such adverbs exceptional, as would have to be the case in an inflectional treatment.

11.1 Adjective

There are languages for which it can be argued that they lack a distinct category of adjectives: for discussion see the collection of papers in Dixon & Aikhenwald (2004), and the review of this collection by Spencer (2008). However, where a distinct adjective class exists, the extent of grammatical differentiation between adjectives and other major classes, in particular verb and noun, may show a considerable amount of variation. Also, the size of the adjective class can vary from very small and closed, as in Hua and Igbo, to very large and open, as in English and French. A considerable amount of work has been devoted to the establishment of a universal conceptual basis for adjectives (for a summary of a quarter of a century of research see in particular Dixon 2004).

Adjectives typically denote concepts which are one-dimensional, in distinction to nouns, and stative, in distinction to verbs (Gardenfors 2000). The adjective class, whether it be small or large, includes words which belong to at least one of the following semantic types (Dixon 2004: 5ff): DIMENSION (e.g. *big, small, long, tall, short, wide, deep*), AGE (e.g. *new, young, old*), VALUE (e.g. *good, bad*) or COLOUR (e.g. *black, white, red*). This is extended, especially in languages with medium-sized and large adjective classes, to include one or more of PHYSICAL PROPERTY (e.g. *hard, soft, heavy, wet, rough, strong, hot, clean*), HUMAN PROPENSITY (e.g. *happy, clever*) and SPEED (e.g. *fast, slow*). Concepts belonging to these latter types may however equally fall into the verb class, notably physical property, or the noun class. In languages with large adjective classes, a variety of further semantic types may be associated, perhaps partially, with the adjective class. These include: DIFFICULTY (e.g. *difficult, hard, simple*), SIMILARITY (e.g. *similar, like, other*), QUANTIFICATION (e.g. *all/whole, some, many*), QUALIFICATION (e.g. *true, possible, usual, correct*), POSITION (*high, low*) and NUMERALS (e.g. cardinals *one, two*; ordinals *first, second* etc.). In English, following the *Cambridge Grammar* analysis, cardinal numerals and the majority of basic quantificational items, for example *many, few, all, some*, but not *only* or *numerous*, belong rather to the distinct class of determinatives.

In most languages adjectives serve at least two functions: (a) modifier within NP (*a good proposal*), and (b) intransitive predicate or predicative complement (*this proposal is good*). In a language where adjectives can function directly as intransitive predicates, without the introduction of a copula, the adjective class is more ‘verb-like’ and adjectives must be differentiated from verbs in other ways, for example by occurrence in comparative constructions. In English, where adjectives function as predicative complements of the copula *be*, the adjective class is ‘non-verb-like’ (Dixon 2004: 14). It is not immediately obvious from a typological point of view that either of the modifying and predicative functions should be considered the more fundamental. Although there are languages such as Yoruba in which adjectives cannot appear predicatively, there are equally languages such as Edo in which adjectives cannot (except indirectly, for example as predicates in a relative construction) occur as modifiers. Thompson (1989) claims that adjectives have two basic discourse functions: (a) to predicate a property (textually the

most frequent use), but also (b) to identify a new referent by limiting the denotation of a noun. On the other hand, Croft (1990, 1991) takes the attributive function to be fundamental. In English, although there is a large overlap between the items which can occur attributively and predicatively, there are in addition both a significant number of both attributive-only and never-attributive forms. Either function could therefore in principle have been taken as the frame for the distributive core. The decision to take the attributive position as the frame was based on the fact that adverbs are not observed in this position.

Textual frequency provides a reasonably coherent picture of the core of the adjective class in English.²⁰ In Table 3 we list the sixty most frequent adjectives, based on counts from the spoken language section of the British National Corpus (BNC):²¹

Table 3. Sixty most frequent English adjectives (based on frequency per million words of spoken text in BNC). Morphologically simple items are shown in bold face.

	/mill		/mill		/mill
1 good	1549	21 second	287	41 possible	146
2 other	1258	22 important	277	42 open	143
3 first	963	23 wrong	243	43 interesting	143
4 right	884	24 only	238	44 British	139
5 last	792	25 particular	231	45 third	131
6 little	741	26 lovely	230	46 real	130
7 new	609	27 whole	227	47 clear	130
8 nice	600	28 small	215	48 black	129
9 next	589	29 full	205	49 main	127
10 big	545	30 bloody	203	50 large	126
11 old	536	31 difficult	200	51 okay	124
12 different	493	32 fine	180	52 special	123
13 sure	473	33 general	178	53 fair	122
14 sorry	428	34 young	178	54 easy	121
15 great	365	35 happy	175	55 white	119
16 alright	363	36 true	174	56 short	118
17 long	361	37 high	170	57 hard	118
18 able	334	38 certain	170	58 social	113
19 local	297	39 national	164	59 free	112
20 bad	293	40 funny	160	60 actual	111

It is immediately obvious that the most frequent adjectives are to a significant extent morphologically simple, though the percentage of such items drops with frequency: 1–10 (100%), 11–20 (70%), 21–40 (65%), 41–60 (65%). They also generally denote simple concepts from the semantic types identified above (e.g. *good*, not *excellent*; *new*, not *pristine*). More specifically, we have the distribution in (57):

(57) SEMANTIC TYPES OF CORE ADJECTIVES IN ENGLISH

VALUE:	<i>good</i> (1), <i>nice</i> (8), <i>great</i> (15), <i>alright</i> (16), <i>bad</i> (20), <i>important</i> (22), <i>lovely</i> (26), <i>fine</i> (32), <i>funny</i> (40), <i>interesting</i> (43), <i>okay</i> (51)
SIMILARITY:	<i>other</i> (2), <i>different</i> (12)
ORDINAL:	<i>first</i> (3), <i>last</i> (5), <i>next</i> (9), <i>second</i> (21), <i>third</i> (45)
JUSTIFICATION:	<i>right</i> (4), <i>wrong</i> (23), <i>fair</i> (53)
DIMENSION:	<i>little</i> (6), <i>big</i> (10), <i>long</i> (17), <i>small</i> (28), <i>large</i> (50), <i>short</i> (56)
AGE:	<i>new</i> (7), <i>old</i> (11), <i>young</i> (34)
HUMAN PROPENSITY:	<i>sure</i> (13), <i>sorry</i> (14), <i>able</i> (18), <i>happy</i> (35)
DOMAIN:	<i>local</i> (19), <i>general</i> (33), <i>national</i> (39), <i>social</i> (58)
PRIMACY:	<i>only</i> (24), <i>particular</i> (25), <i>main</i> (49), <i>special</i> (52)
QUANTIFICATION:	<i>whole</i> (27)
PHYSICAL PROPERTY:	<i>full</i> (29), <i>open</i> (42), <i>free</i> (59)
EXPLETIVE:	<i>bloody</i> (30)
DIFFICULTY:	<i>difficult</i> (31), <i>easy</i> (54), <i>hard</i> (57)
EPISTEMIC:	<i>true</i> (36), <i>certain</i> (38), <i>possible</i> (41), <i>clear</i> (47)
POSITION:	<i>high</i> (37)
COLOUR:	<i>black</i> (48), <i>white</i> (55)
NATIONALITY:	<i>British</i> (44)
AUTHENTICITY:	<i>real</i> (46), <i>actual</i> (60)
SPEED:	—

With the exception of SPEED, each of the semantic types identified by Dixon contains at least one item, and one type, namely VALUE, is particularly well-populated and disparate, although for each adjective it is a reasonable generalisation that a subjective evaluation is being made. We have taken the liberty of replacing Dixon's QUALIFICATION with two separate types: EPISTEMIC and JUSTIFICATION. These latter can have a moral dimension, and be predicated of both acts and the individuals that perform them (*It is right to do this/You are right*). In addition, we have identified five further groupings which probably merit separate headings: EXPLETIVE, PRIMACY, DOMAIN, AUTHENTICITY and NATIONALITY. The term PRIMACY is used in *The Cambridge Grammar* for a small group of modifiers which tend to occur very early in the pre-head structure, and the term DOMAIN is one which naturally links the function of the adjectives listed with corresponding adverbs in *-ly*.

Taking instead the sixty most frequent morphologically simple adjectives would add, in order of frequency: *extra* (QUANTIFICATION), *red* (COLOUR), *ready* (PHYSICAL PROPERTY), *poor* (PHYSICAL PROPERTY), *major* (PRIMACY), *hot* (PHYSICAL PROPERTY), *single* (QUANTIFICATION), *simple* (DIFFICULTY), *cold* (PHYSICAL PROPERTY), *low* (POSITION), *early* (TEMPORAL), *odd* (JUSTIFICATION), *strong* (PHYSICAL PROPERTY), *proper* (JUSTIFICATION), *blue* (COLOUR), *well* (PHYSICAL PROPERTY), *quick* (SPEED). Beyond introducing the first TEMPORAL item (*early*) and the first SPEED item (*quick*), it is clear that, apart from changing the distribution in favour of PHYSICAL PROPERTY, this does not fundamentally alter the overall picture.

11.2 Adverbs

Although there are detailed treatments of particular adverb classes in individual languages, notably French (Molinier & Levrier 2000), discussion of adverbs tends to be subsumed under a more general discussion of the adjunct or adverbial function (e.g. Bartsch 1976; van der Auwera 1998; Ernst 2002). Typologically, too, proposals on the universal basis for a class of adverbs lag markedly behind comparable proposals for the class of adjectives. A notable exception is the work of Ramat & Ricca (1994, 1998), albeit restricted largely to European languages.

First of all, it is not known with certainty whether a class of adverbs can be postulated in every language. Nevertheless, closer inspection of Palauan, a language which has been claimed to be without an adverb class (Hagège 1982: 90ff, cited by Ramat & Ricca 1994: 291), reveals a small set of morphologically simple words, dubbed ‘qualifying words’ by Josephs 1975: 480–1), which have a plausible distribution (X + verb) and indeed seem to fulfil basic adjunct functions. These are, using the semantic classification of adjuncts from *The Cambridge Grammar* (ch 8): (1) *kmal* ‘very/often’ (DEGREE/FREQUENCY), (2) *kilo* ‘almost’ (DEGREE), (3) *di* ‘only, just’ (FOCUSSING), (4) *dirk* ‘still’ (ASPECTUAL), (5) *locha* ‘perhaps’ (MODAL). Locative and temporal adjunct functions are relentlessly fulfilled by what look like preposition phrases headed by a single preposition *er*, while other adjunct functions, including the MANNER function, are expressed using subordinate clauses. The parallel with languages which have minimal adjective classes is striking, and it is tempting to speculate that, just as with adjectives, we might expect most languages to have at least a minimal set of adverbs with the function of verb/clause modifier and belonging to a core set of semantic types.

We can gain further insight into this core set by examining the sixty most frequent adverbs in English, as shown in Table 4:²²

It is immediately obvious that the most frequent adverbs are to a significant extent not formed with *-ly*, though the percentage falls off sharply with frequency: 1–10 (100%), 11–20 (90%), 21–40 (60%), 41–60 (35%). Conversely, a good proportion of the most frequent adjectives do not permit suffixation with *-ly*, and even when they do, the adverbs most frequently do not have standard manner interpretations.²³ Most of the

Table 4. Sixty most frequent English adverbs (based on frequency per million words, spoken and written, in BNC). Asterisked items represent an estimate rather than an actual count. Non *-ly* items are shown in bold face.

	/mill		/mill		/mill
1 also	1255	21 already	338	41 longer	126
2 just	1241	22 later	313	42 recently	124
3 only	1153	23 almost	309	43 quickly	120
4 very	1150	24* too (additive)	299	44 anyway	118
5* well	1064	25 ever	270	45 generally	116
6 even	861	26 probably	269	46 nearly	113
7* how	752	27 actually	258	47 suddenly	112
8 still	681	28 therefore	234	48 obviously	108
9 again	582	29 particularly	220	49 exactly	105
10 as	558	30 thus	206	50 immediately	103
11 however	556	31 sometimes	203	51 maybe	102
12 never	541	32 soon	200	52 easily	98
13 really	472	33 usually	192	53 though	98
14 always	451	34 indeed	187	54 earlier	97
15 rather	425	35 certainly	184	55* better	93
16 quite	405	36 especially	176	56 highly	91
17* too (degree)	381	37 clearly	152	57 eventually	90
18 often	378	38 please	130	58 fully	89
19 yet	344	39* long	129	59 otherwise	88
20 perhaps	341	40 finally	128	60 directly	87

most frequent (1–20) adverbs are, as in the case of adjectives, morphologically simple. Later in the list there are however comparative forms *later*, *longer*, *earlier* and *better*, and other transparent derivations (e.g. *otherwise*, *sometimes*, *indeed* and *maybe*) which reflect the typically diverse origins of adverb classes (Ramat & Ricca 1994).

Allocating these adverbs to semantic types reveals the following distribution:

(58) SEMANTIC TYPES OF CORE ADVERBS IN ENGLISH

FOCUSSING	ADDITIVE:	<i>also</i> (1), <i>even</i> (6), <i>too</i> (24)
	RESTRICTIVE:	<i>just</i> (2), <i>only</i> (3), <i>particularly</i> (29), <i>especially</i> (36),
DEGREE:		<i>very</i> (4), <i>well</i> (5), <i>how</i> (7), <i>too</i> (9), <i>as</i> (10), <i>really</i> (13), <i>rather</i> (15), <i>quite</i> (16), <i>too</i> (17), <i>almost</i> (23), <i>nearly</i> (46), <i>exactly</i> (49), <i>highly</i> (56), <i>fully</i> (58)
ASPECTUAL:		<i>still</i> (8), <i>yet</i> (19), <i>already</i> (21)
SERIAL ORDER:		<i>again</i> (9)
CONNECTIVE:		<i>however</i> (11), <i>therefore</i> (28), <i>thus</i> (30), <i>indeed</i> (34), <i>anyway</i> (44), <i>otherwise</i> (59)
FREQUENCY:		<i>never</i> (12), <i>always</i> (14), <i>often</i> (17), <i>sometimes</i> (31), <i>ever</i> (25), <i>usually</i> (33), <i>generally</i> (45)
MODAL:		<i>perhaps</i> (20), <i>probably</i> (26), <i>actually</i> (27), <i>certainly</i> (35), <i>clearly</i> (37), <i>obviously</i> (48), <i>maybe</i> (51)
TEMPORAL LOCATION:		<i>later</i> (22), <i>soon</i> (32), <i>finally</i> (40), <i>recently</i> (42), <i>suddenly</i> (47), <i>immediately</i> (50), <i>earlier</i> (54), <i>eventually</i> (57)
ILLOCUTIONARY:		<i>please</i> (38)
TEMPORAL EXTENT:		<i>long</i> (38), <i>longer</i> (40)
MANNER		<i>quickly</i> (42), <i>easily</i> (52), <i>better</i> (55), <i>directly</i> (59)

It is an interesting property of the adverb class that a number of forms can fit into more than one semantic type. For example, *also*, additive *too* and *yet* can also be connectives. Some adverbs which primarily act as degree adjuncts, notably *well*, also have manner interpretations. An adverb such as *clearly*, which is primarily modal, can also have a manner function. And an adverb like *directly* which is primarily manner can also have a temporal meaning. These shifts reflect the potential of adverbs to function as modifiers at distinct semantic levels. For example, in the analysis of Ernst (2002): these would be: SPEECH ACT > FACT > PROPOSITION > EVENT > SPECIFIED EVENT. In such cases we have allocated the adverb concerned to what seems to be its predominant textual function. It will be noted too that at least two major semantic types, namely ACT-RELATED (e.g. *intentionally*), and DOMAIN (e.g. *economically*), do not appear.

It is striking that the semantic types which seem to lie at the heart of the adverb class are in general different to those which lie at the heart of the adjective class. The textually most frequent adverbs belong to the same general types, FOCUSsing, DEGREE and ASPECTUAL, which were identified in the minimal adverb class of Palauan. By contrast, VALUE, DIMENSION, AGE and COLOUR seem to be at the heart of the adjective class. Neither do SERIAL ORDER, CONNECTIVE and FREQUENCY appear to be dominant semantic types for adjectives. Some of the less frequent types do have close parallels, in particular EPISTEMIC/MODAL and TEMPORAL, but again TEMPORAL is not a basic adjective type. And finally, as observed by Ramat & Ricca (1994), the MANNER type does not itself lie at the heart of the adverb class. The first manner adverb in our list is *quickly*, ranked 42. And, as we have seen, SPEED adjectives do not even make it into the top 60.

To conclude, we note that:

- (i) The semantic basis of the core of the adjective and adverb classes is largely different, whether we base this on typological arguments or textual frequency.
- (ii) There is at most a marginal overlap lexically between the most frequent adjectives and adverbs.
- (iii) The majority of the textually most frequent adjectives do not have manner adverb counterparts in *·ly*.
- (iv) The semantic role of *·ly* is very diverse.
- (v) The most frequent adjectives and adverbs are morphologically simple.

These points add up to an overwhelming case that adjective and adverb are conceptually distinct categories, and where adjective/adverb pairs exist, the relationship should be thought of as a derivational one. As Zwicky (1995) points out, treating *·ly* as inflectional would require *inter alia* the postulation of paradigms in which a significant proportion of the core members of each class had no counterparts.

12 Concluding remarks

In this paper, on the basis of a well-motivated delimitation of the adjective and adverb categories, we have shown that the complementarity claim, the notion that adjectives and adverbs occur solely in mutually exclusive environments which can be defined in a simple categorial way, is false. We have also shown that the single category claim, the notion that adverbs are related to adjectives inflectionally rather than derivationally, cannot be justified by appealing either to the putative complementarity between adjectives or the lack of it. Distribution *per se* is not a valid basis for a decision.

Nevertheless, an analysis of the conceptual basis of the adverb category, together with the fact that at the heart of the category there are a number of simple monomorphemic items, leads us to conclude that there is a solid basis for postulating a major category of adverbs in English. If adverbs form a distinct major category, then the relationship between adverb and adjective must be one of lexical word-formation.

What then is strange about the adverb category? It is somewhat heterogeneous semantically (but then so is the adjective category). It contains fewer basic,

monomorphemic items than other major categories (but this is a matter of degree). Most certainly its most salient feature is the pervasiveness of the formative *·ly*, which can be used to derive adverbs in all semantic types. This indeed is a unifying characteristic of the category. While there are of course some other word-formation processes afoot, for example derivatives in *·wise* and *·ways* and compounds such as *maybe*, the affix *·ly* is to a large extent a marker of category membership. Such general markers of category membership, whatever the category, have been claimed to be rare, except in pidgins (Bakker 2003: 13). However, perhaps languages with a fully differentiated adverb category are a good place to look for this phenomenon more generally.

Appendix

- 16: http://www3.oup.co.uk/healed/hdb/Volume_11/Issue_04/110519.sgm.abs.html
- 17a: <http://her.oxfordjournals.org/cgi/content/abstract/11/4/519>
- 17b: bmj.bmjournals.com/cgi/reprint/318/7180/346.pdf
- 17c: <http://www.earlham.edu/publicaf/ridingarena080403.html>
- 17d: http://www.parl.gc.ca/36/1/parlbus/chambus/house/debates/205_1999-04-12/han205_2140-e.htm
- 18a: http://www.mckenzie.com/news_health_CWD.asp
- 18b: <http://www.agr.gc.ca/cal/epub/report/report-0002.html>
- 18c: http://www.highland.gov.uk/cx/pressreleases/archive2000/november2000/selective_strike.htm
- 18d: <http://www.nap.edu/books/030903535X/html/35.html>
- 18e: http://www.dfat.gov.au/qwon/2003/qwn_030513b.html
- 19a: <http://www.angleseymining.co.uk/ParysMountain/LeafletAHT98/history.htm>
- 19b: <http://www.civil.canterbury.ac.nz/fire/pdfreports/Gerlich.PDF>
- 19c: <http://www.jtac.com/rotate.htm>
- 19d: <http://www.militantsthetix.co.uk/yealm/yealm23.htm>
- 20a: <http://www.geocities.com/AtlanticShakes/ascabout.htm>
- 20b: <http://www.abc.net.au/7.30/s271965.htm>
- 21a: <http://www.parliament.the-stationery-office.co.uk/pa/cm199900/cmhansrd/vo000626/text/00626w23.htm>
- 21b: http://www.aspendailynews.com/Search_Columns/view_column.cfm?OrderNumber=1177
- 21c: <http://www.smlawpub.com.hk/cases/2003/0224.htm>
- 22a: <http://www.parliament.the-stationery-office.co.uk/pa/cm199900/cmselect/cmagric/681/0070503.htm>
- 22b: http://www.careers.nestle.com/html/meet/1996_history.asp
- 22c: <http://www.wx-fx.com/janes.htm>
- 22d: <http://www.claykeck.com/patty/docs/terms.htm>
- 23a: <http://www.tambcd.edu/bcdwebcomm/chat/transcripts/lichen/lp042998.html>
[Sept09]
- 23b: <http://www.chazhound.com/forums/t70716-2/> [Sept09]
- 23c: http://james.psych.umn.edu/auditory_process_schiz.html
- 24a: <http://www.hazardchase.co.uk/client/andrewwatkinsonfullbiog.shtml>
- 24b: <http://www.wsws.org/articles/2001/jul2001/sri-j10.shtml>
- 24c: <http://www.fishing.net.nz/reports/viewreport.cfm?ReportID=1014>

- 24d: <http://www.heartland.org/archives/environment/mar01/private.htm>
 24e: <http://www.granatellimotorsports.com/GM200MPH.HTM>
 24f: <http://www.movies101.com/ATANARJUAT.HTML>
 24g: <http://www.abc.net.au/stateline/act/content/2003/s880541.htm>
 24h: www.parliament.the-stationery-office.co.uk/pa/cm200203/cmselect/cmodpm/1168/1168we22.htm
 31a: www.clarica.com/E/learn/Investments/SegFunds/index.asp
 31b: <http://www.angelfire.com/space/usis/bond.pdf>
 45b: [www.hks.harvard.edu/fs/jfrankel/AthensDecade\\$euroRMB-J.doc](http://www.hks.harvard.edu/fs/jfrankel/AthensDecade$euroRMB-J.doc) [Jan2010]
 45c: www.filmhead.com/video/102099.html
 45d: www.austen.com/derby/old_2003/malini9e.htm
 45e: www.joehenderson.com/archive/home.php?article=1361
 47a: http://www.arts.arizona.edu/flax/stories_5.html
 47b: www.kootenaytaxi.com/aboutthestaff.htm [Jan2010]
 51a: www.brooksidessoapbox.co.uk/fan_fiction.htm
 51b: <http://www.sureslim.co.uk/forum/showthread.php?t=10189&page=112> [Jan2010]
 51c: www.shoal.net.au/mwoa/book_extracts/poland.html
 51d: [hoosierparanormal.com/frail_woman.html](http://www.hoosierparanormal.com/frail_woman.html)
 55a: <http://www.iERG.net/ideas-research/cog-tools?MythSummary.html>
 55b: <http://www.storystite.org/story/lesliesdinerparty~01.html>

Notes

1. There is also the issue of 'gerunds', which are generally defined in traditional grammar as verbal nouns. This means that in *What is the use of my repeatedly scolding him?* (an expansion of an example in the *Concise Oxford Dictionary* entry for 'gerund') the adverb must be taken to be modifying a noun. The *Macquarie Dictionary* definition of adverb explicitly caters for this: 'one of the parts of speech comprising words used to modify or limit a verb, a verbal noun (also, in Latin, English and some other languages, an adjective or another adverb), or an adverbial phrase or clause'.
 However, we take the form *scolding* in this example to be a verb, not a noun (a more or less standard account in modern linguistically-oriented work). This construction, with *my repeatedly scolding him* a clause, contrasts with *my repeated scolding of him*, which is an NP with the head *scolding* a noun. One major difference is precisely that the pre-head modifier is an adverb in the first but an adjective in the second. A further difference is that while verbs can take objects nouns cannot, so we have *him* in the first but *of him* in the second. The constructions also differ in that the verb-headed clause takes a subject (genitive, as with *my*, or non-genitive, as with the somewhat informal *me repeatedly scolding him*), while the noun-headed NP takes a determiner (a genitive NP or a determinative: *this*, *the*, etc.). In general the constructions are clearly distinguished in Present-day English, though the existence of a very restricted range of 'hybrids' like *There'll be no stopping her* has to be recognized (cf. *The Cambridge Grammar*: 1189).
2. For more detailed discussion of the interpretation of this kind of adjective, see Bolinger (1967) and Ferris (1993). For Bolinger the 'tertiary' interpretation is one in which the meaning of the adjective is applied to the 'reference' of the noun rather than its 'referent'. For Ferris, examples like *poor liar* and *eager student* are instead special cases of 'secondary' use (Ferris uses the term 'ascriptive' for this, see fn 14) in which the range of interpretation of the

adjective can vary according to the type of thing described. That is, a *poor liar* is one who is deficient qua liar. We note that while *beautiful dancer*, *poor liar* and *eager student* may be interpreted in this way, an example like *heavy smoker* cannot.

3. There is one genuine adverb, *almost*, which appears to be able to function as a pre-head modifier, as illustrated in the following example: *A recent paper by David Gruen, . . . , is an almost textbook case of this type of reasoning.* [Weekend Australian, 19–20.12.09 : 10]. Here *almost* modifies the noun *textbook*.
4. The idea was subsequently developed in the generative tradition by Emonds (1972, 1985), and Jackendoff (1973), who usefully introduced a terminological distinction between transitive and intransitive prepositions. For further discussion, see also *The Cambridge Grammar*: 600–1, 612–16.
5. Some works treat *many* and *few* in this use as nouns rather than pronouns.
6. No previous account in any way covers the full range of adverbs or nouns attested in the adverb postmodifier construction. The construction appears first to have been noted by Jespersen. The earliest citation (Jespersen 1913: 292) is from Dickens: *Mark actually held him to prevent [his interference foolishly]*. This example involves a manner adverb, and we would consider it unacceptable in Present-day English. A further set of examples where it is claimed that adverbs modify nouns can be found in Jespersen (1940: 82–3, 109). Some of these illustrate archaic usages, for instance *What alone I remember is [his often and ever notable preaching in those years]* (Carlyle), in which *often* is attributive and best analysed as adjectival. We also disregard examples which involve supplements, examples containing items which *The Cambridge Grammar* would not treat as adverbs, and examples with verbal rather than nominal *-ing* forms. However three clear examples remain: (i) *the importance of it socially to Ethelberta* (domain adverb); (ii) *the shutting of the gates regularly at ten o'clock* (frequency adverb); (iii) *the daily reading of the Bible aloud to his mother* (manner adverb *aloud*).

The examples in Lee (1998: 139) are restricted to *people locally/regionally/nationally* and *the news lately/recently*; these are of unquestionable grammaticality (compare examples 24d and 24g). By contrast, Fu *et al.* (2001) are concerned exclusively with derived process nominalisations. They note the conclusion of previous authors, including Chomsky (1970), that adverbs are incompatible with such nominalisations, and correctly observe that this conclusion is overstated. However, their examples are, in the main, artificially constructed with a view to demonstrating that process nominalisations contain a syntactic VP whose verbal head moves upwards to gain its nominal characteristics. We would admit their examples with temporal adverbs, for example *Jane's resignation so suddenly* or *the shutting of the gates regularly* (this latter example of course originally from Jespersen). We also admit distributional adverbs like *individually* in examples such as *the committee's destruction of these documents individually* (compare example 21a). However many of Fu *et al.*'s examples with manner or degree adverbs seem at best marginal. Fu *et al.* themselves question *thoroughly* in *his explanation of the problem to the tenants thoroughly*, and *completely* in *protection of children completely from bad influence*. We also consider as dubious act-related adverbs like *purposefully* in *the removal of evidence purposefully*. Compare Baker (2003: 284) for a similar example with *deliberately* which he himself treats as marginal: ^(c)*[Kim's removal of the evidence deliberately] impeded the investigation.*

7. With the exception of examples (23a) and (23b), all the numbered examples in sections 5.1 and 5.2, as well as later examples (31), (45c–e), (47a), (51a), (51c) and (55), were found using the Google search engine via the software front end KwicOnGugle written by Professor

Hiroaki Sato of Senshu University, to whom we are indebted for assistance. We are also grateful to an anonymous reviewer of a previous draft of this paper for pointing out to us the potential existence of the manner adverbs *positively* and *negatively* in the postmodifying adverb construction. Examples (23a) and (23b), as well as examples (45b), (47b) and (51b) were subsequently found using WebCorp. A full list of URLs is given in an appendix. In the discussion of the postmodifying adverb construction, we of course exclude from consideration a variety of irrelevant examples found in the corpus searches but which belong to other construction types. Firstly, we exclude examples with postposed complements such as *Group teachers are requested to monitor the attendance closely of all their students*. Here the adverb *closely* transparently modifies the verb *monitor* and the phrase *of all their students* is a postposed complement of the noun *attendance*. Secondly, also irrelevant are constructions such as *This subject has been the focus, deliberately, of scorn and derision*, where the adverb is in *Cambridge Grammar* terms a supplement and not integrated into the structure of the NP. Thirdly, we exclude a textually very frequent type in which the adverb is a focussing adverb with a following complement of the noun in its scope. A typical example [BNC: CR8 3024] is *The old constraint is federalism: the grant only of certain powers to central government*. Here, *only* could be replaced by a whole range of adverbs, e.g. *particularly, primarily, partly, mainly, especially, simply, solely, predominantly, exclusively, chiefly, largely, merely*. And finally, we exclude a closely related type of construction with the adverb *respectively*. An example [BNC CR9 2049] would be: *The two men who mattered most were Serbs: Mr Milosevic and Radovan Karadzic, the leaders respectively of the Serbs of Serbia and the Serbs of Bosnia*. The presence of the focusing adverbs, and of *respectively*, is clearly licensed in such examples by the presence of the following complement.

8. It should also be noted that the many examples of this type in sections 5.1–5.3 undermine the claim of Fu *et al.* (2001: 565) that adverbs in the adverb postmodifier construction cannot precede any direct argument. In their system, adverbs as adjoined modifiers are standardly predicted to remain in VP despite the movement upward of arguments. In *The Cambridge Grammar* (454), no requirement is imposed that post-head complements should precede modifiers: the ordering is determined by weight as well as function.
9. This test is due to Grimshaw (1990: 58). As is correctly observed by Fu *et al.* (2001), however, Grimshaw's classic distinction between complex and simple events appears to have little bearing on the adverb postmodifier construction. For example, *the destroying totally of the common enemy* (22d) is unequivocally a complex event in Grimshaw's terms: the NP must be definite and the complement *of the common enemy* cannot be omitted. However *a timber shortage internationally* (19b) is not.
10. A possible parse of (28a) is that the adverb *generally* modifies the event nominalisation *reporting*. However, it seems to us that the more likely interpretation, the one corresponding to the bracketing we have assigned, is that *generally* modifies the noun *media*.
11. The adverbs which we find in the postmodifier construction are significantly not related to these adjectives. The adverb *presently* is not an exception, since its meaning more closely parallels the (exclusively temporal) sense of the adjective *present* that we find in attributive modifier function, e.g. *the present danger*. It cannot therefore be argued that the existence of the adverb postmodifier construction in any way represents a breakdown of the adjective/adverb distinction in post-head position.

12. For this reason we reject a suggestion by one WS reviewer that the complementarity claim might be reformulated to include the linear position of modifiers. Under such a revision, in which adjectives would generally be pre-head modifiers of nouns and adverbs would be post-head modifiers of nouns, all cases of post-head modification by adjectives would be in some way special, and complementarity would extend further than under the definition adopted in (1). However, the cases in (32d) and (32e) are not special constructions: they are simply cases of general adjectival modification where the attribute is syntactically complex.
13. All the collocations in (36–7) are found in the BNC. We ignore textually frequent cases such as *real* ADJ, e.g. *real poor*. Here, however it is analysed, *real* is just a non-standard version of *really*.
14. The term ‘ascriptive’ as applied to predicative complements appears to originate with Lyons (1977: 435, 469), where it contrasts with ‘equative’ (rather than ‘specifying’, the term preferred by *The Cambridge Grammar*). In a usage which we do not adopt here, Ferris (1993) extends the use of ‘ascriptive’ to adjectives in modifier function. It is then contrasted with the term ‘associative’, as exemplified by the adjective *nuclear* in *nuclear scientist*, where the property ‘nuclear’ is not valid of the entity denoted by *scientist*. Associative interpretations are generally barred from predicative positions. The term ‘predicand’ for the noun phrase of which a predicate is predicated is an innovation of *The Cambridge Grammar*.
15. There is a further somewhat marginal case illustrated in the following constructed exchange (we have not located any attested example): A. *When did you last see your mother?* B. *Oh, quite recently.* A. *When, precisely?* B. *At Easter.* A. *That doesn’t seem quite recently to me.* (Or, *Easter isn’t quite recently.*) This use is effectively metalinguistic, commenting on the validity of B’s answer to the first question.
16. A WS reviewer complains that *short* and *shortly* are not transparently related. We note however that (i) the adjective *short* has a clear temporal sense, and (ii) that other temporal adverbs have similar derivations, e.g. *presently*, *immediately*.
17. The grammaticality of degree-modified adverbs as external modifiers in indefinite examples varies considerably, and even the best examples like (55b) may for many speakers not be fully acceptable. However, (55b) can be compared with, for instance, the following example: ²*He paused in front of Miranda, took her hand and said, in [as dramatically a depressing way as he could], ‘Miranda — my partner, my friend... I’ll miss you.’* (<http://www.bonkers-online.com/texts/tokyo.txt>). When the adverb is directly focussed, as here, on the attributive adjective, there are two competing constructions of impeccable grammaticality: (i) *in an as dramatically depressing way as he could*, and (ii) *in as dramatically depressing a way as he could*.
18. It is in the non-predicative adjunct contexts that we find the non-standard examples illustrated by *love me tender*, *treat me nice*, *hold me tight*, and – stepping away from popular songs – *drive safe*, *sleep tight*, *tie him up good*, *he hurt me real bad*, etc. A nice example came up in a film soundtrack clip played on National Public Radio, complete with the film reviewer mentioning in advance that it is ‘ungrammatical’: *I’m going to put this as simple as I can...* (from *The Matrix Revolutions*). Given that the non-predicative adjunct contexts are those where non-derived adverbs are found, we do not regard these as examples of adjectival contexts. What we see here is merely an extension of the category of adverbs which are morphologically identical with adjectives.
19. For a historical discussion of the development of the affix *-ly* in English (and the different development of its counterpart in German), see Pounder (2001). The adjective-deriving function of *-ly* is historically prior, and adverbs formed from adjectives, including those in

- ly*, were in Old English suffixed with *·e*: The loss of this adverb-forming *·e* in Late Old English and Middle English is one of the main factors leading to the reanalysis of *·ly* as an adverb-deriving suffix.
20. We leave it open whether it is possible, or worthwhile, to try to establish a detailed list of 'prototypical' adjectives in English, as has been attempted for French by Goes (1999). The potential criteria (morphologically simple, semantically basic, historically well-established, gradable, able to occur both attributively and predicatively) would give similar, but not identical results to the textual frequency criterion. For our purposes, textual frequency has the advantage of not requiring introspective decisions, and is sufficient to provide a coherent frame of comparison with other classes.
 21. The spoken section of the BNC (Oxford University Press, <http://www.natcorp.ox.ac.uk>) was used because of the facility with which the frequencies could be calculated without thinning. An analysis of the whole corpus, spoken and written, did not yield qualitatively different results, though adjectives such as *economic*, *international* and *European* clearly appear more frequently in written texts. High frequency forms tagged as adjectives by the BNC automatic tagger but omitted from the table are *supposed* (participle) and *concerned* (of which an estimated 40% of occurrences are participles in the frame *as far as X am/is/are concerned*). Added is *next* as in *the next day*, but excluding the prepositional use in *next to*. The version of the BNC used here and elsewhere in the paper was BNCweb (CQP edition), developed by Sebastian Hoffmann (University of Lancaster) and Stefan Evert (University of Osnabrück).
 22. Estimates were applied in the case of the asterisked homonymous adverb/adjective pairs (*well*, *how*, *long*, *better*) where an examination of 100 examples tagged as adverbs by the BNC's automatic tagger revealed a probable tagging error of greater than 3%. Instances of *as well* (*as*) were excluded from the estimated count for *well*, and instances of interrogative *however* were excluded from the count for *however*. Estimates are also applied in the case of the two meanings of *too*, degree and additive focus, which seem sufficiently distinct not to be considered merely as senses of a single item.
 23. For example, out of the twenty most frequent adjectives, eight do not have adverb counterparts in *·ly* at all (*good*, *other*, *little*, *next*, *big*, *old*, *alright*, *long*). Only *nice*, *different*, *able*, *bad* and *sorry* have clear manner adverb counterparts, though *badly* also has a salient degree interpretation, and the manner sense of *sorribly* ('in a pitiful manner') only corresponds to a secondary sense of the adjective *sorry*, not the primary sense of 'regretful'.

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